

VIADRUS

Your home heating
since 1888

NAOS K4

Manual for boiler operation and installation



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General Information

Dear Customer

Thank you for your purchase of the NAOS K4 boiler and for your confidence in VIADRUS a.s.

To become familiar with a proper operation of your new product since the beginning, please read carefully the presented user's manual, especially Chapter No. 5 – Boiler Attendance by the user, Chapter No. 6 – Maintenance, and Chapter No. 7 – IMPORTANT NOTICES. We ask you to follow the information presented below and especially to perform the prescribed annual inspections to be performed by an authorized specialized company, which guarantees a long-term boiler operation free of failures to both your and our satisfaction.

1. Produced Versions of the Boilers

In your order specify the following:

Order specification code:

NAOS K4 X X X XX X X

Exchanger: G: stainless Sermeta	Water heating: 1: without installed three-way valve with a pump 2: three-way valve, pump, HSW exchanger 3: with a three-way valve with a pump	Electrical equipment: S: SIT	Output: 24: 24 kW	Fuel: Z: natural gas P: propane	Cover color: W: white R: red S: silver B: black
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Conversion of the NAOS K4 boiler from natural gas to propane and vice-versa can be performed by a contracted service provider only.

Chimney flue made by ALMEVA has been certified for this boiler. If you use chimney flue made by a different producer, it is necessary to use a system with identical parameters as for the certified type of the chimney flue.

2. Boiler Application and Benefits

The NAOS K4 condensing boiler has been designed for combustion of low pressure natural gas.

The size of the condensing boiler is suitable for heating of family houses and recreational facilities as well as for reconstruction of heat sources in individual apartment units. The condensation heat output is 5 – 24 kW.

The boiler body efficiency at the 50/30 °C temperature gradient varies in a range of 101 – 105 % depending on the required output.

Boiler Benefits:

- Low gas consumption
- High combustion efficiency
- Smooth output modulation
- Easy attendance and maintenance
- The boiler enables connecting to a reservoir of hot service water heater and ensures its preferential heating
- Reliability of the regulation and safety components
- Low weight
- Equithermal boiler regulation

General Information

3. Technical Data

Tab. No. 1 Sizes, operation temperature and electrical variables

		K4G1S24ZX	K4G1S24PX	K4G2S24ZX	K4G2S24PX	K4G3S24ZX	K4G3S24PX
Fuel type	[-]	ZP	Propane	ZP	Propane	ZP	Propane
Category of appliance	[-]	I _{2H} I _{2E}	I _{3P}	I _{2H} I _{2E}	I _{3P}	I _{2H} I _{2E}	I _{3P}
Version		C ₁₃ , C ₃₃ , C ₄₃ , C ₅₃ , C ₈₃					
Weight	[kg]	26		27.5		26.5	
Water volume	[l]	2		3		2	
Boiler dimensions – width	[mm]	460					
– depth	[mm]	320					
– height	[mm]	720					
Ø of combustion air connection	[mm]	80					
Ø flue gas socket	[mm]	80, 60					
Working water overpressure	[bar]	3					
Testing water overpressure	[bar]	5					
Pressure loss	[-]	See diagram 1					
Maximum permitted working temperature	[°C]	85					
Heating water setting range	[°C]	25 - 85					
Hot water setting range	[°C]	-		35 - 65		35 - 65	
Connecting overpressure of fuel	[mbar]	20	37	20	37	20	37
Noise level	[dB]	< 50					
Boiler connection							
- heating water output	[Js]	¾"					
- heating water input to the heater	[Js]	-		½"		½"	
- return heating water input	[Js]	¾"					
- return water input from the heater	[Js]	-		½"		¾"	
- condensate outlet	[mm]	Ø 25					
- safety valve output	[mm]	Ø 21,2					
- gas inlet	[Js]	¾"					
Connecting voltage		1/N/PE 230VAC 50 Hz, TN-S					
El. power input including pump	[W]	110					
El. covering	IP	40					

Tab. No. 2 Thermal – technical parameters

comparison conditions 15 °C and 101.325 kPa, dry gas

		K4G1S24ZX	K4G1S24PX	K4G2S24ZX	K4G2S24PX	K4G3S24ZX	K4G3S24PX
Boiler output range	[kW]	5 - 24					
Nominal output 80/60 °C	[kW]	22,2					
Nominal output 50/30 °C	[kW]	P=24					
Minimum output 50/30 °C	[kW]	P=5					
Maximum nominal heat input	[kW]	Q=22.8					
Minimum nominal heat input	[kW]	Q=4.6					
HSW flow with ΔT 38 °C	[l.min ⁻¹]	-		8,3		-	
Boiler efficiency at the nominal output 80/60°C	[%]	Up to 98					
Boiler efficiency at the nominal output 50/30°C	[%]	Up to 105					
Volume flow rate of fuel	[m ³ .h ⁻¹]	0.5-2.4	0.2-0.9	0.5-2.4	0.2-0.9	0.5-2.4	0.2-0.9
Mass flow rate of flue gas	[kg.h ⁻¹]	8 - 45					
Nox class	[-]	5					
Flue gas temperature (max.)	[°C]	85					

General Information

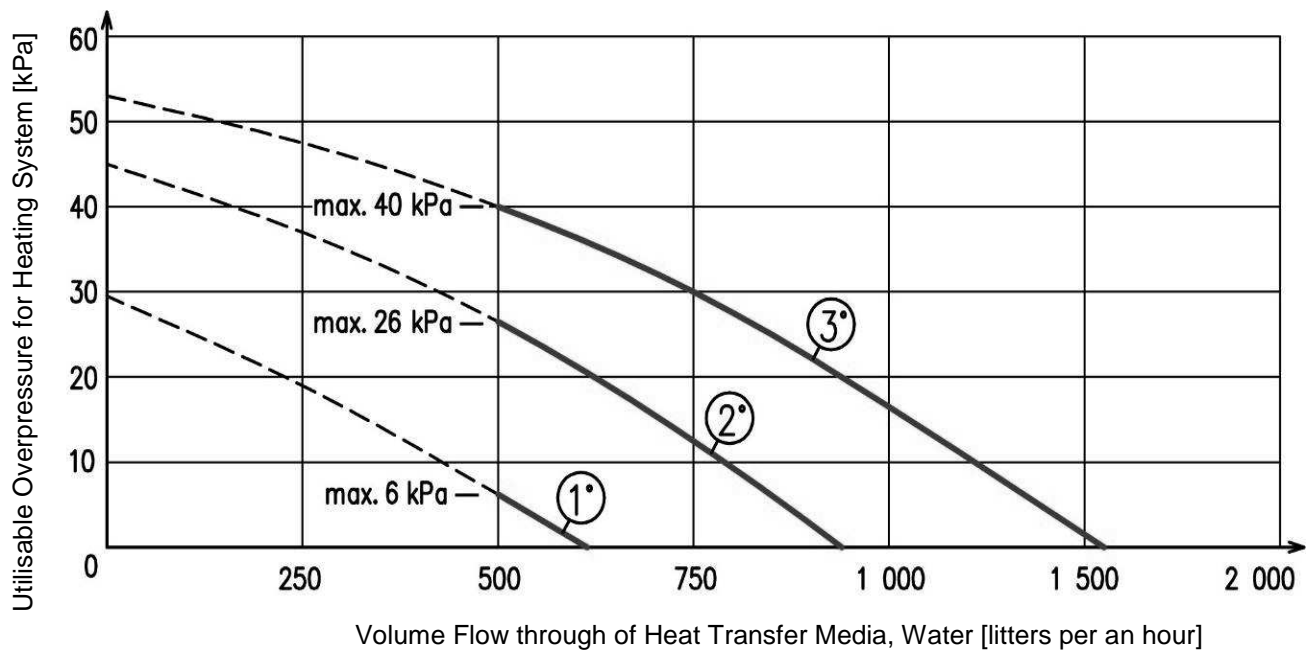


Diagram no. 1 A diagram of the boiler heating circuit hydraulic loss

If the central heating system is fitted by thermostatic valves, it is necessary in order that their correct function was ensured and noisiness was restrained. For usual installations when the C.H. system is connected on the boiler, it is necessary to keep the dynamic overpressure in the system at the value of 8 - 15 kPa (0.8 - 1.5 m column of H_2O). For this purpose a pressure relief valve must be fitted (e.g. Heimeier HYDROLUX DN 20) in the system. It will be set on the required value of the pressure. The pressure relief valve is usually fitted next to the boiler.

If the heating system is in a large distance from the boiler, the pressure relief valve may be placed at the place of the system branching with advantage. The pressure relief valve ensures also the required minimal flow through in the boiler in a case of radiator valves closing.

Values of the maximal overpressure have been also stated in the graph. They are intended for the individual adjustments of power output grades of the circulating pump that is available in the heating system. Minimal flow through the boiler drum is 500 l / hour. From the graph, it follows that the required flow through won't be reached by exceeding of the maximal dynamic overpressure.

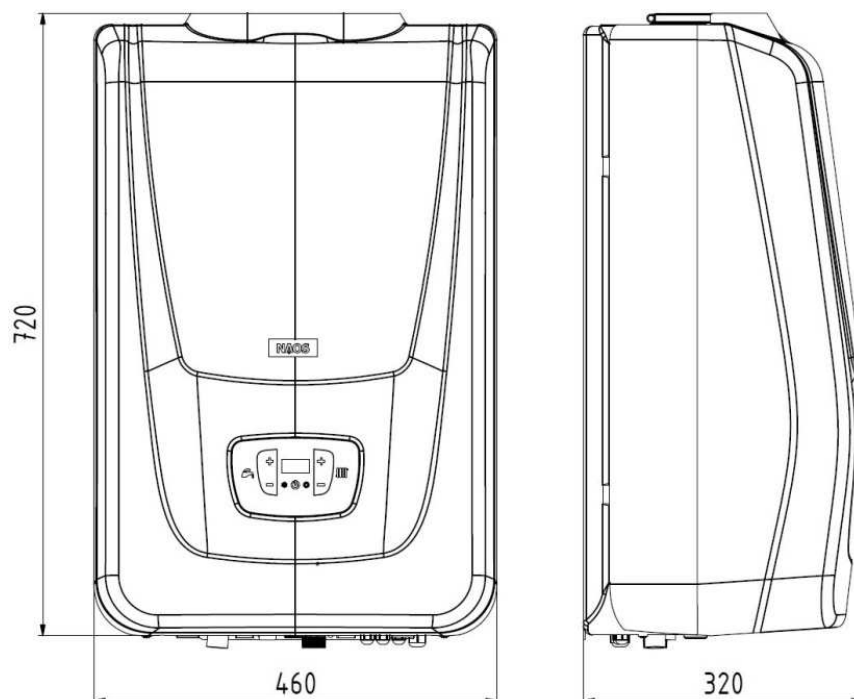


Fig. no. 1 The main boiler dimensions

General Information

4. Boiler Description

4.1 Boiler Design

The boiler elementary structure consists in a condensing exchanger made of stainless steel pipes. It is checked for tightness by test overpressure 5 bar. The boiler is further equipped with a premix burner. The combustion mixture is mixed in a mixer in the preset air-gas ratio within the entire output range. Air is supplied to the mixer by a modulation fan.

The boiler is made in three versions:

NAOS K4G1S24XX	version designed for heating only is equipped with a circulation pump
NAOS K4G2S24XX	version with a circulation pump and flow type hot water (hereafter referred to as "HSW") heater
NAOS K4G3S24XX	version with a circulation pump and a three-way valve ready to be used in combination with a reservoir type hot water heater

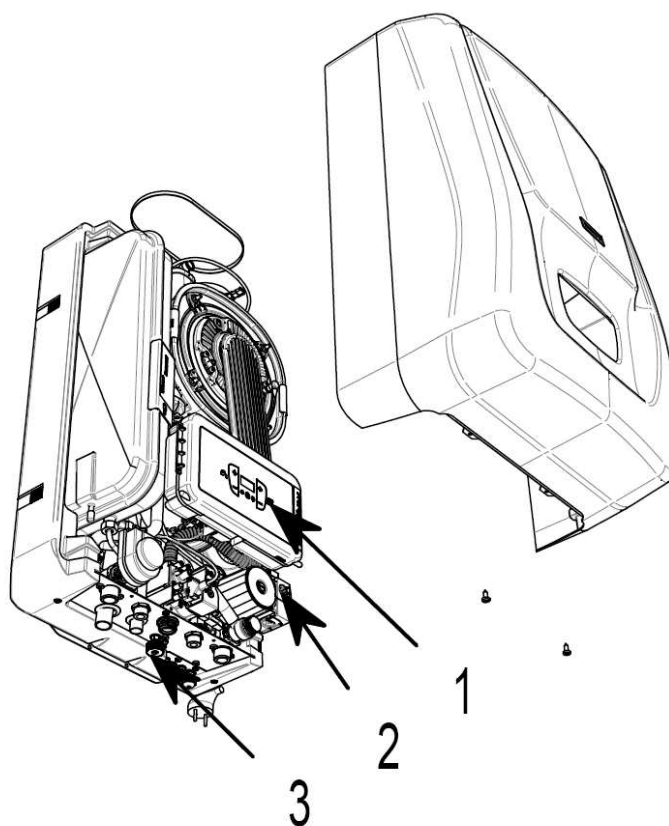
The SIT automatics is an electronic control and ignition automatics designed for gas-fired central heating boilers with a modulated fan and burner with preliminary mixing.

The combustion air inlet and the flue gas outlet may be implemented by several means as follows:

- to the chimney,
- through the wall,
- through the roof (either inclined or horizontal),
- to a joint shaft.

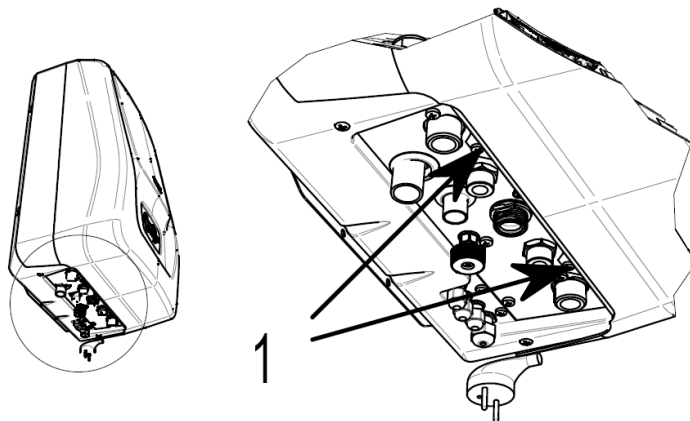
The boiler is an appliance in version C, i.e., a closed appliance with electronic ignition and flame ionization.

4.2 Control Features

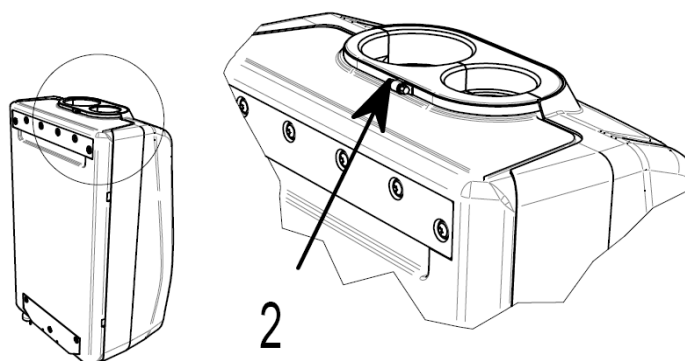


- 1 electronic panel with the control panel
- 2 circulation pump output setting switch
- 3 valve for adding water to the heating system

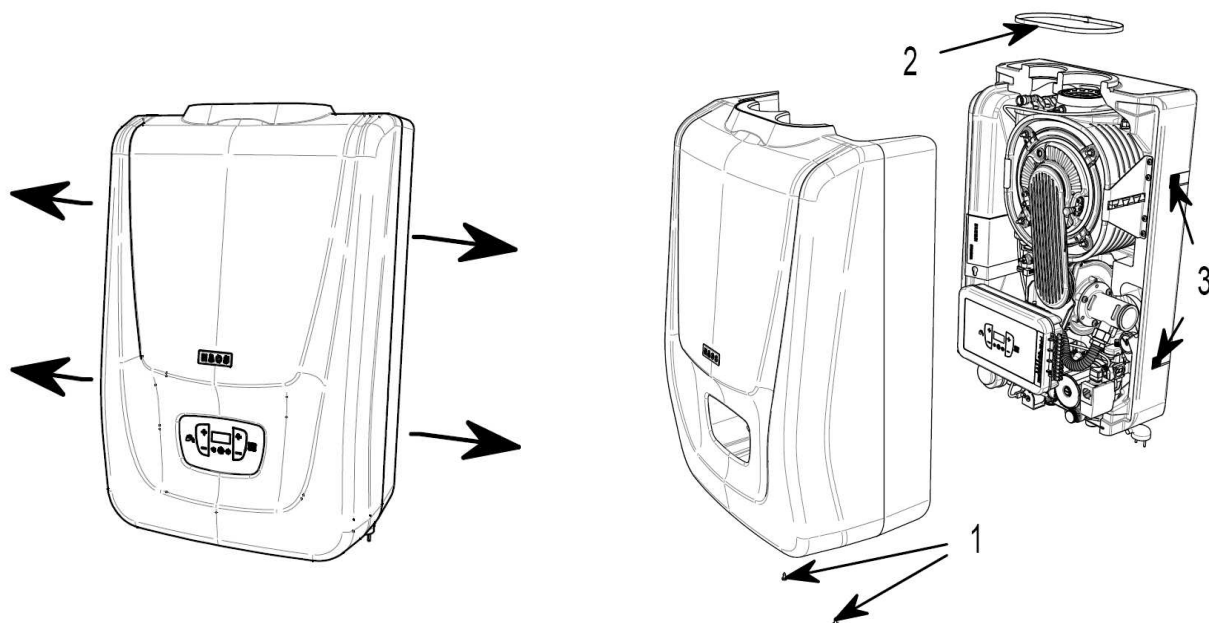
Fig. no. 2 The NAOS K4 boiler control panel



- Remove the bolts (1)



- Remove the binding strip (2)

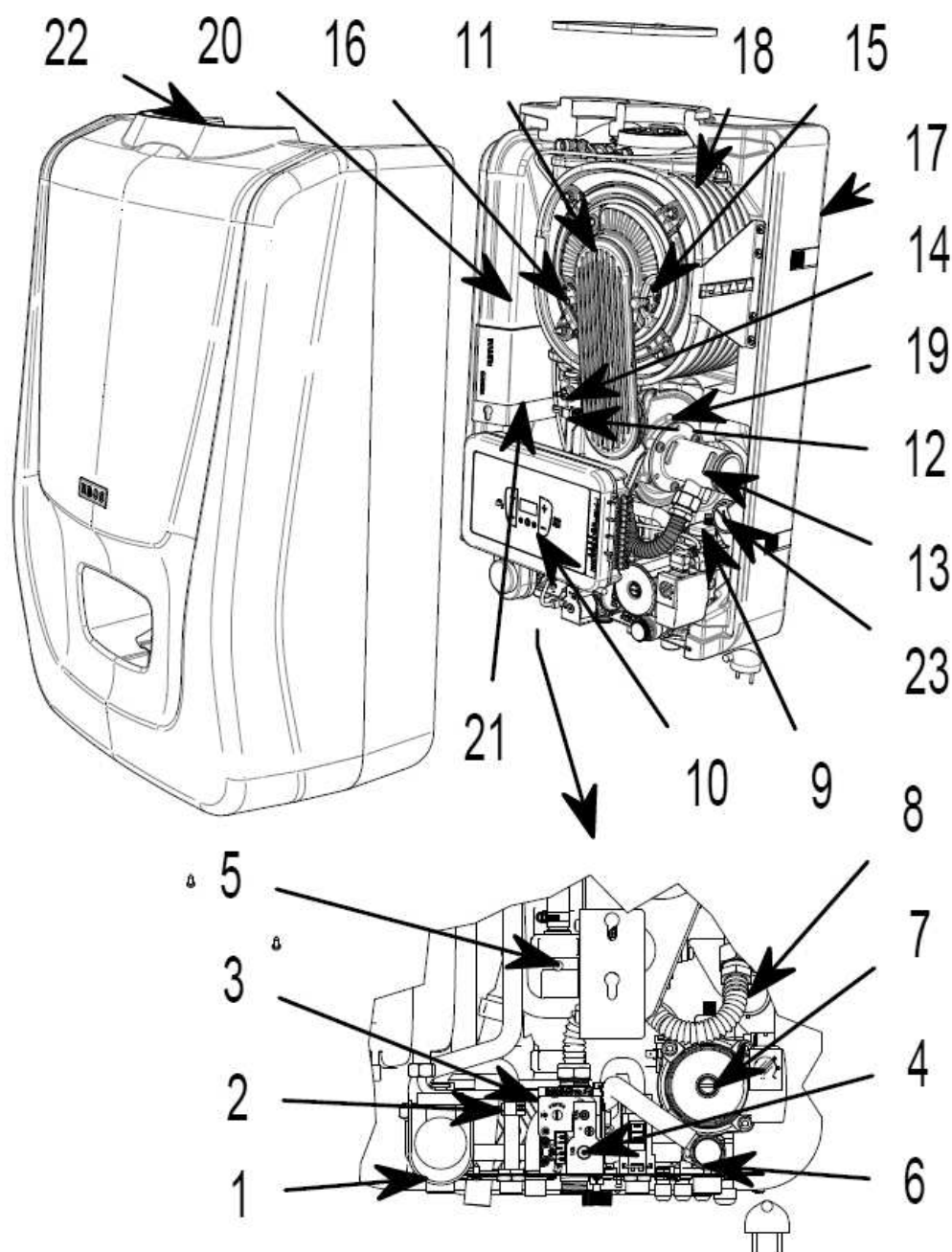


- Pulling the cover side detach the Velcro strip (3)
- Remove the front cover

Fig. no. 3 Removing the boiler front cover

General Information

4.3 Main Boiler Parts



- | | | | |
|----|---|----|----------------------------------|
| 1 | three-way valve (only for versions K4G2S24XX and K4G3S24XX) | 11 | burner plate |
| 2 | HSW temperature sensor (only for version K4G2S24XX) | 12 | heating water temperature sensor |
| 3 | HSW exchanger (only for version K4G2S24XX) | 13 | mixer |
| 4 | gas valve | 14 | safety thermostat |
| 5 | siphon | 15 | ignition electrode |
| 6 | safety valve | 16 | ionization electrode |
| 7 | circulation pump | 17 | boiler frame |
| 8 | gas supply pipe | 18 | exchanger |
| 9 | bleeder valve | 19 | fan |
| 10 | boiler electronics | 20 | expansion tank |
| | | 21 | name plate |
| | | 22 | boiler front cover |
| | | 23 | pressure gauge |

Fig. no. 4 The NAOS K4 boiler assembly (version shown - K4G2S24XX)

General Information

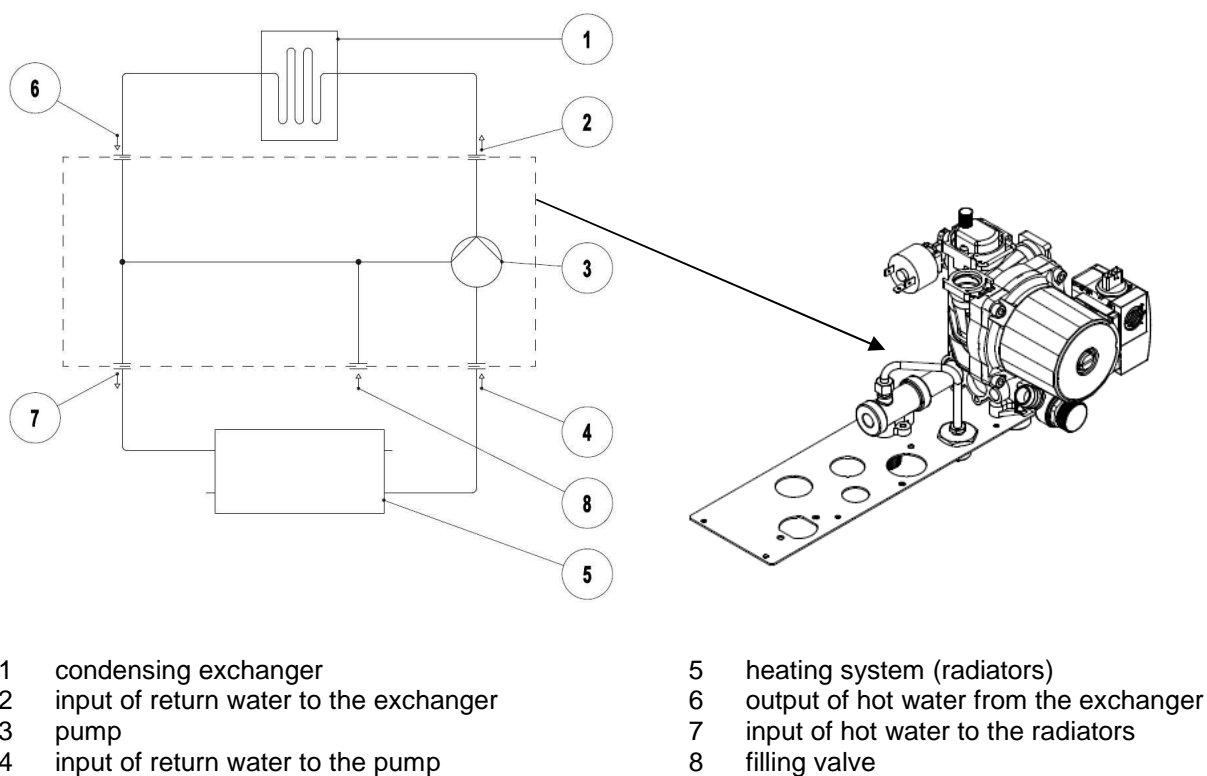


Fig. no. 5 NAOS K4G1S24XX with only water heating for the system
(hydraulic diagram of the version and the sketch of the hydro-block)

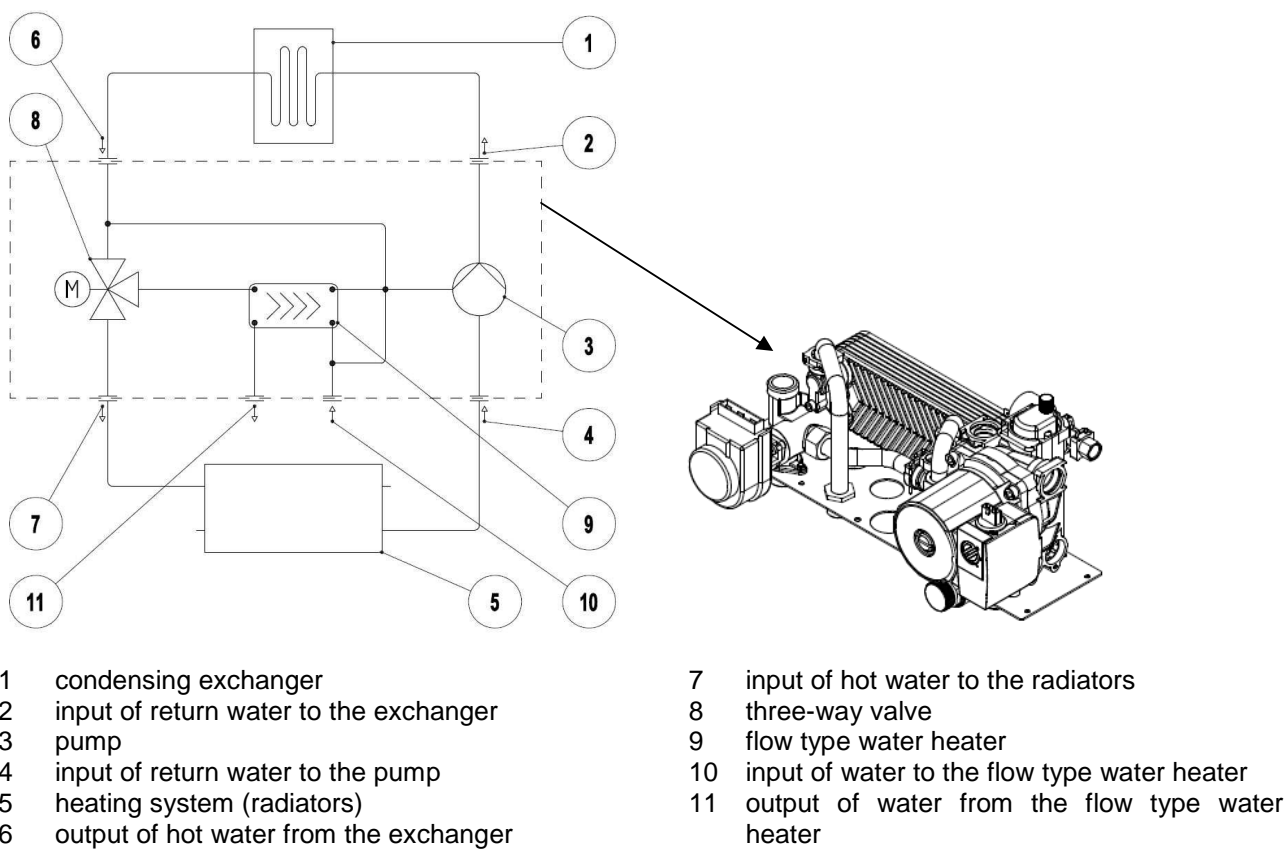
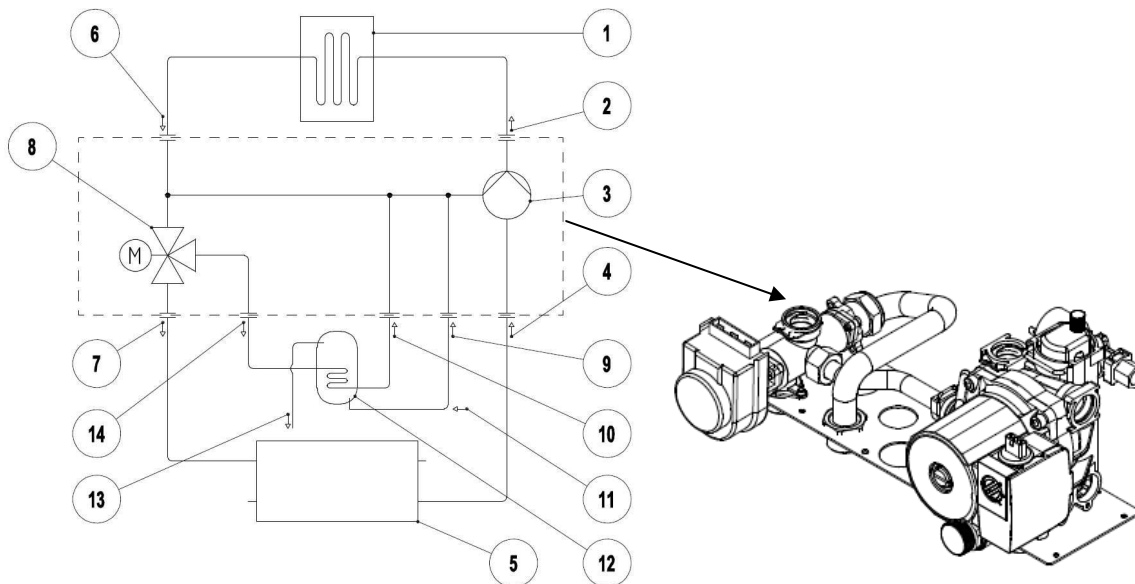


Fig. no. 6 NAOS K4G2S24XX with a flow type heater
(hydraulic diagram of the version and the sketch of the hydro-block)

General Information



- | | | | |
|---|--|----|-------------------------------------|
| 1 | condensing exchanger | 8 | three-way valve |
| 2 | input of return water to the exchanger | 9 | filling valve |
| 3 | pump | 10 | output of hot water from the heater |
| 4 | input of return water to the pump | 11 | refilling of water to the system |
| 5 | heating system (radiators) | 12 | reservoir type water heater |
| 6 | output of hot water from the exchanger | 13 | relief valve of the heater |
| 7 | input of hot water to the radiators | 14 | input of water to the heater |

Fig. no. 7 NAOS K4G3S24XX the boiler version
(hydraulic diagram of the version and the sketch of the hydro-block)

4.4 A diagram showing flue gas flow in the exchanger

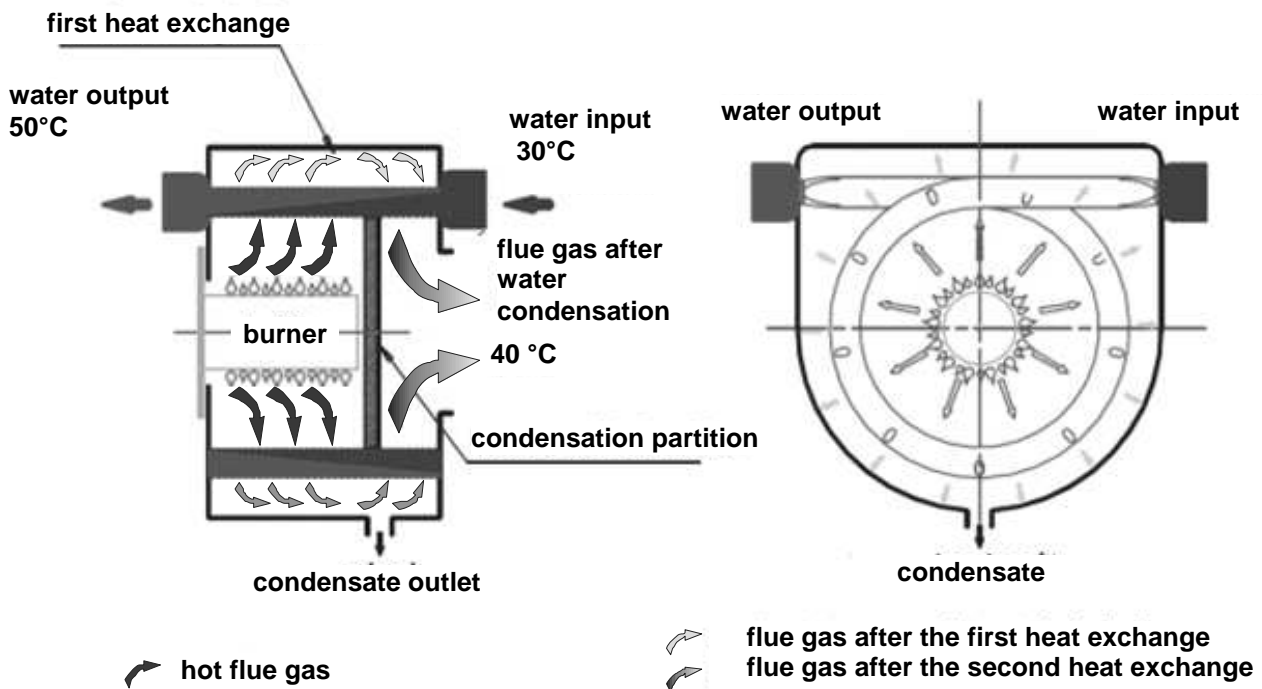


Fig. no. 8 A diagram showing flue gas flow in the exchanger

4.5 Delivery and Accessory

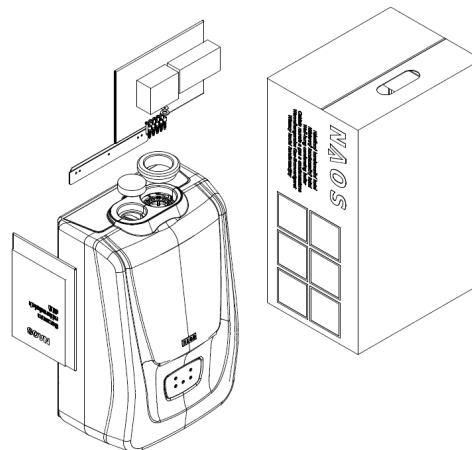
The NAOS K4 boiler is delivered as assembled on a pallet, packed in a carton cover. Flue gas ducting is delivered in accordance with the customer requirements based on the actual connection of air inlet and flue gas outlet (see chapter 11).

Standard accessory for all boiler versions:

Mounting bracket	1 pcs
Dowel - 8 x 40 mm	5 pcs
Bolt - 5 x 40	5 pcs
Chimney opening reducer piece	1 pcs
External sensor PL10K	1 pcs
Blinding plug D80	1 pcs
Operation and installation manual, including the warranty certificate	
A list of contracted servicing organizations	
For version NAOS K4G3S24XX (hot water exchanger):	
sensor QAZ 36.526/109	1 pcs

Recommended accessory for all boiler versions:

Room thermostat	1 pcs
ALMEVA flue gas ducting, Type: LIK, STAR or FLEX	
Water filter	
Opentherm (Honeywell CR 04)	



The recommended accessory is not included in the boiler standard price.

4.5 Instructions before Putting into Operation

The boiler can only be commissioned by organizations that are authorized and trained for this purpose by the manufacturer.

The installation shall comply with the regulations that are applicable for this equipment. The boiler shall be compatible with the local connecting conditions (checking the parameters of the boiler with the information on the name plate).

During the first start of operation of the boiler it is necessary to instruct the user in accordance with this manual and to hand over this manual to the user.

Then it is necessary to perform:

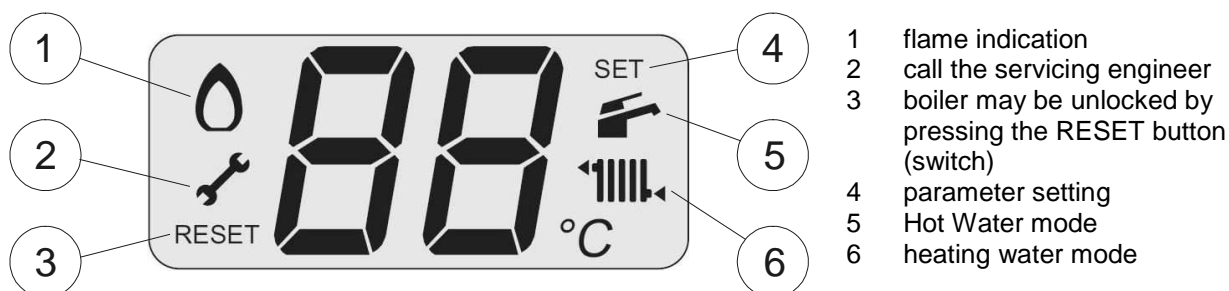
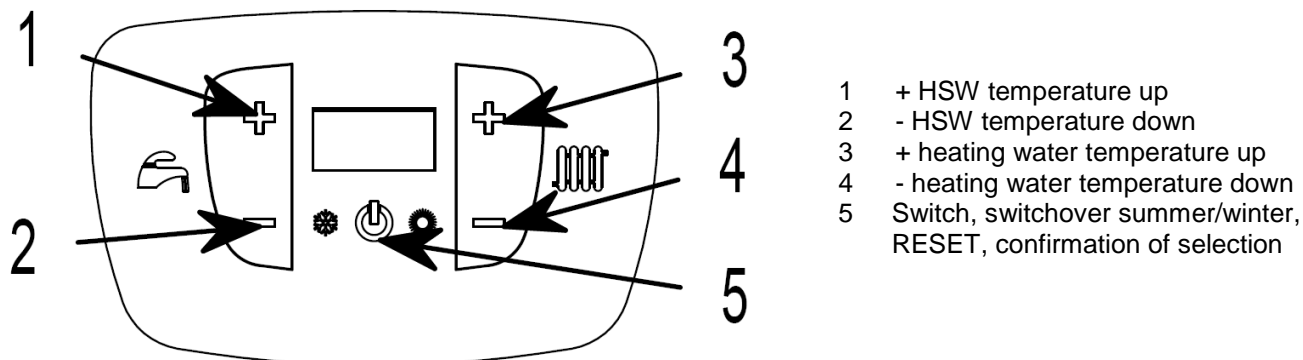
- inspection revision before commissioning,
- inspection for any water leakages,
- inspection of instrumentation and safety controls.

Notice:

The ABS boiler cover is protected by a protection foil. This foil needs to be removed before commissioning of the boiler or 1 month from unpacking the boiler from the packaging carton at the latest. Removing the foil after this period may be more difficult.

5. Boiler Attendance by the User

Description of the control panel



Parameters shown on the boiler screen. Basic summary:

Legend for description of the functions:

RESET	This symbol indicates the necessity of restarting the boiler by the user by the „RESET“ button
	This symbol indicates the necessity of a repair by a servicing organization
	Graphic display of a flashing symbol



5.1 Description of the control functions


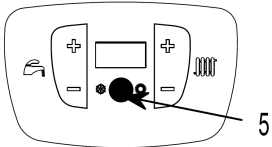

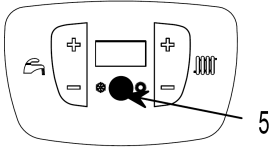
The symbols and values shown on the screen are described below. The basic information shown on the screen is the heating circuit temperature – in case of hot water heating it is the temperature measured on the hot water sensor.

Setting the required temperature of hot water and system water temperature is performed by using buttons 1 - 4 on the boiler control panel.











When the higher level regulation is used, this option is blocked on the boiler and temperatures can be set using the room instrument only.











5.1.1 Activation of the boiler

The boiler is energized even after turning off and the electronics ensures anti-freezing protection and (if set) also short operation of the circulation pump in regular intervals to prevent freezing.

Screen	Description
	Stand-by mode
	To turn on the boiler press down the main switch button (5) and hold it for some time.
	For switching the boiler to the summer mode see chapter 5.3.3
	To turn off the boiler press down the main switch button (5) and hold it for some time (5 sec).

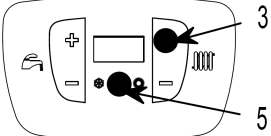
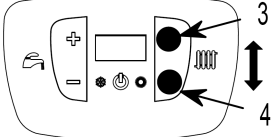
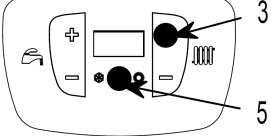
5.1.2 Values shown on the boiler screen

Screen	Description
	When controlled by the thermostat, the thermostat is open
	Boiler in the summer mode, the primary circuit temperature is shown
	Boiler in the winter mode, the primary circuit temperature is shown
	HSW heating, current HSW temperature is shown
	Heating water heating, current temperature is shown
	Ignition of the burner
	Burner in operation
	Boiler is off, anti-freezing function is active
	Ignition of the burner is postponed due to the system settings
	Indicator of the servicing inspection requirement.

Screen	Description
	Requirement for refilling of water to the heating system. The FL symbol is shown in the 1s intervals.
	Preheating of the hot water circuit. Shown only when this function is active.
	
	Accident protection active, bP+temperature flashing
	Heating water temperature setting (other symbols not shown)
	Higher level regulation connected (4 s interval)
	HSW temperature setting, (other symbols not shown)
	Pump rundown
	"Chimney-sweeper" function LP = output HSW MIN hP = output MIN cP = output MAX dP = output HSW MAX (setting parameters P09=01)
	

5.2 INFO mod

Information messages shown on the screen that are used for checking the boiler parameters.

Screen	Multiplier, units	Description
		For entering the Info Mode press down button 3 and 5 simultaneously and hold them down for 5 s
		Scrolling in the Info Menu by the + and – buttons
d0		Not used
d1	°C	Outside temperature (temperature measured by the outside sensor B9 – if connected)
d2	x 0.1	K-factor
d3	x 0.1	Offset of the heating curve (K-factor) – (see diagram no. 3)
d4	°C	Temperature computed on the basis of the outside sensor
d5	°C	Water output temperature
d6	°C	Return water temperature (not shown for the NAOS boiler in the SIT version)
d7	°C	Actual temperature HW
d8	°C	Flue gas temperature
d9	x 100, rpm	Fan revolutions (Ex.: 44x100=4400)
dc		Software version: - burner control
dd		Software version: –the main board
de - c9		Not used
		For exiting the Info Mode press down button 3 and 5 simultaneously.

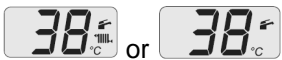

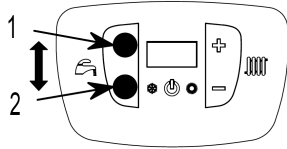


5.3 Parameter setting

The boiler control varies depending on connecting the boiler to the heating system

Boiler (terminal) wiring diagram	Description	Hot water	Heating water	Setting the hot and heating water temperature
	Boiler without the room device and without the outside sensor.			Boiler control panel
	Boiler without the outside sensor, room thermostat connected.			Boiler control panel
	Boiler without the outside sensor, OPENTHERM room device with communication connected.			Room device
	Boiler without the room device, the outside sensor connected.			Water temperature to the system is computed based on the outside temperature and setting of the heating curve K-factor. For changing the values see chapter 5.3.7 and 5.3.8.
	Boiler with the outside sensor and the room thermostat connected.			Water temperature to the system is computed based on the outside temperature and setting of the heating curve K-factor. For changing the values see chapter 5.3.7 and 5.3.8.
	Boiler with the outside sensor and OPENTHERM room device with communication			Water temperature to the system is computed based on the outside temperature and setting of the heating curve K-factor. For changing the values see chapter 5.3.7 and 5.3.8. Changing the hot water temperature by the room device only.

5.3.1 Setting the hot water temperature


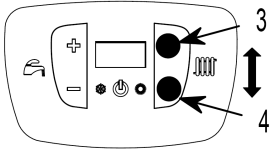


When the OPENTHERM higher-level regulation is connected, the screen shows the current temperature. Changing the hot water temperature setting is done by the room device.

Screen	Description
 or 	Change the temperature setting when the boiler is turned on.
	Set the desired temperature using button 3 or 4. The temperature can be set with a range of 30 – 60 °C.
	When you press button 3 or 4 for the first time the screen will show the current temperature setting and the faucet symbol on the screen will be flashing.
	When the parameters are not changed within 5 s the current temperature setting will be stored and the boiler will switch to the normal mode.

5.3.2 Setting the temperature of water to the heating system


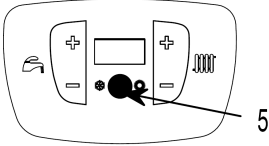
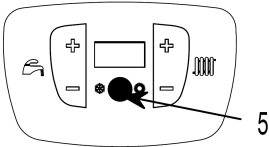


When the OPENTHERM higher-level regulation is connected, the screen shows the current temperature. Changing the hot water temperature setting is done by the room device.

When the outside sensor is connected, the temperature of water to the heating system is computed based on the outside temperature.

Screen	Description
	Change the temperature setting when the boiler is turned on.
	Set the desired temperature using button 3 or 4. The temperature can be set with a range of 25 – 85 °C.
	When you press button 3 or 4 for the first time the screen will show the current temperature setting and the radiator symbol on the screen will be flashing.
	When the parameters are not changed within 5 s the current temperature setting will be stored and the boiler will switch to the normal mode

5.3.3 The SUMMER/WINTER switch (version K4G2S24XX and K4G3S24XX)

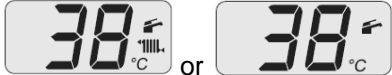
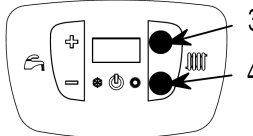


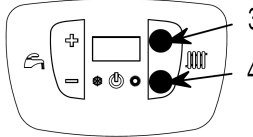

Setting the boiler for summer and winter operation. When the boiler is switched to the summer mode the requirement for heating of water to the system is ignored.

Screen	Description
	Stand-by mode.
	To activate the boiler by press down the main switch button (5) and hold it for some time. The boiler will start operation in the winter mode.
	For switching to the summer mode press down the main switch button (5) and hold it for 2 s.
<div>  <p>Winter mode</p> </div> <div>  <p>Summer mode</p> </div>	

5.3.4 Temporary activation

Temporary activation of the boiler for heating of water to the heating system – only when the system is equipped by the outside sensor.

This setting is used to force the boiler to heat water to the heating system. The boiler will be in operation for a period not longer than 24 h or until switching back to the normal mode.

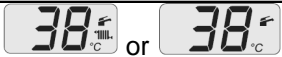
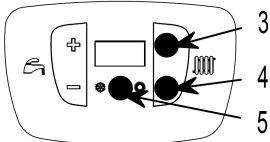

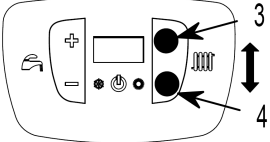

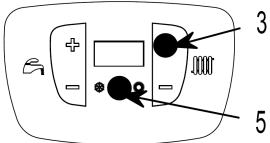
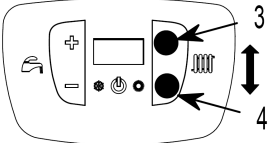

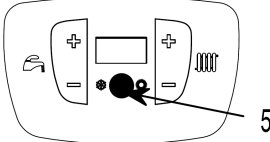
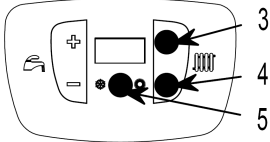
Screen	Description
	Change the mode setting when the boiler is turned on
	Press down buttons 3 and 4 simultaneously
	The mode is activated
	The value of the output temperature to the heating system
	To deactivate this mode press down buttons 3 and 4 simultaneously
	The system is deactivated

5.3.5 Setting the anti-cycling period (PR10)

This parameter is used to prevent frequent starting of the boiler to the heating system. This is the minimum period of time for which the requirement for heating to the system will be ignored. The default setting is 3 min.

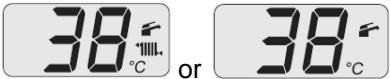

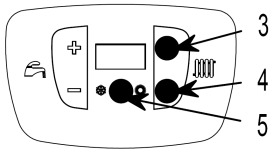

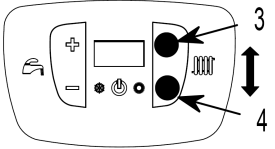
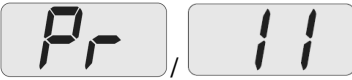
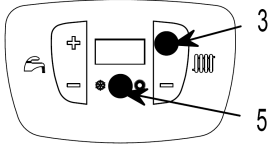
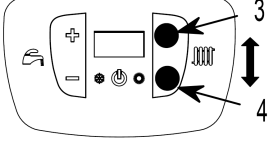
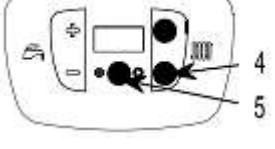
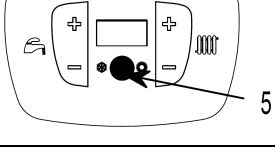
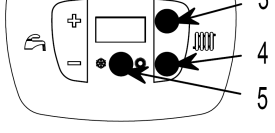
This value does not have any impact on executing the requirement for starting the boiler in case of a requirement for heating of hot water.

The setting range is 0 – 600 s. The shown value needs to be multiplied by 6, i.e., $10 \times 6 = 60$ s

Screen	Button pressing time	Description
		Switching to the servicing mode shall be done when the boiler is turned on
	10 s	Switch the boiler to the parameter setting mode by simultaneous pressing of buttons 3, 4 and 5 for a period of 10 s
		The screen will show PR / 01
		Set the required parameter on the screen using button 3 or 4
		Set the parameter PR / 10 on the screen using button 3 or 4
	2s	Switch the boiler to the value setting mode by simultaneous pressing of buttons 3 and 5 for a period of approx. 2 s .
		The default setting for anti-cycling period is 3 min. The setting range is 0 – 600 s. The shown value needs to be multiplied by 6, i.e., $10 \times 6 = 60$ s
		For switching back without changing the parameters simultaneously press down buttons 4 and 5.
	Press shortly	To confirm the set value press shortly button 5 on the main switch
	10 s	To exit the setting mode simultaneously press down buttons 3, 4 and 5 for 10 s

5.3.6 Setting the pump rundown (PR11)

This parameter is used to set the pump rundown. The default setting for the rundown is 1 min. The setting range is 0 – 600 s. The shown value needs to be multiplied by 6, i.e., $10 \times 6 = 60$ s.

Screen	Button pressing time	Description
 or 		Switching to the servicing mode shall be done when the boiler is turned on
	10 s	Switch the boiler to the parameter setting mode by simultaneous pressing of buttons 3, 4 and 5 for a period of 10 s
		The screen will show PR / 01
		Set the required parameter on the screen using button 3 or 4
		Set the parameter PR / 11 using button 3 or 4
	2s	Switch the boiler to the value setting mode by simultaneous pressing of buttons 3 and 5 for a period of approx. 2 s.
		The default setting for rundown period is 1 min. The setting range is 0 – 600 s. The shown value needs to be multiplied by 6, i.e., $10 \times 6 = 60$ s
		For switching back without changing the parameters simultaneously press down buttons 4 and 5.
	Press shortly	To confirm the set value press shortly button 5 on the main switch
	10 s	To exit the setting mode simultaneously press down buttons 3, 4 and 5 for 10 s

5.3.7 Setting the heating curve K-factor (PR15)

When the outside sensor is connected to the boiler the temperature of water to the heating system is computed on the basis of the outside temperature and the value of the set K-factor

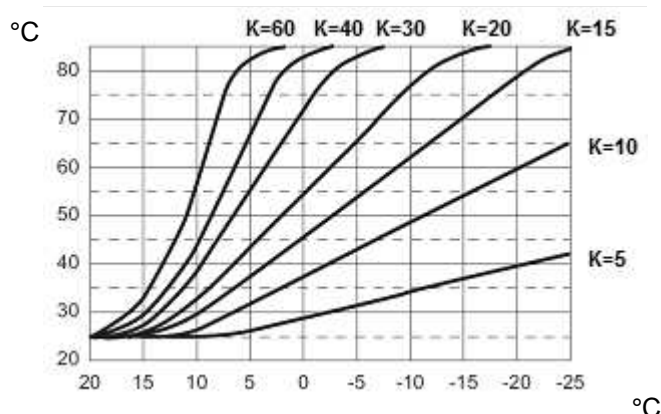


Diagram no. 2 Heating curves for a boiler without connected room device

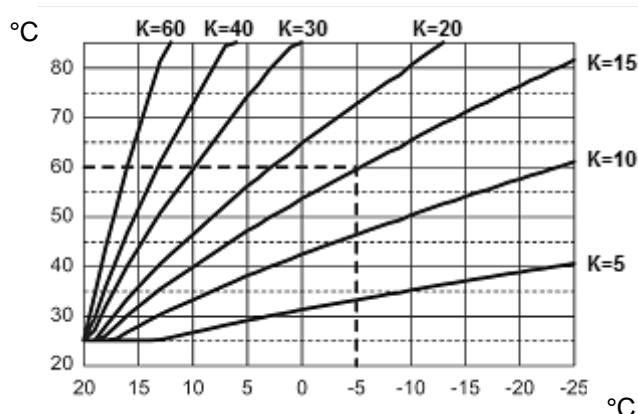
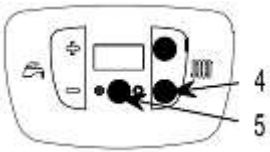
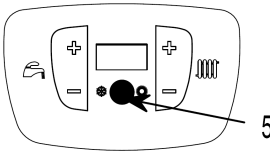
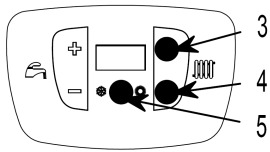


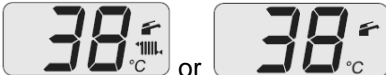
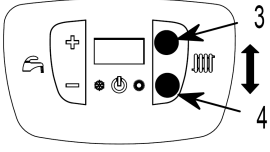
Diagram no. 3 Heating curves for a boiler with connected room device (OPENTHERM)

Screen	Button pressing time	Description
		Switching to the servicing mode shall be done when the boiler is turned on
	10 s	Switch the boiler to the parameter setting mode by simultaneous pressing of buttons 3, 4 and 5 for a period of 10 s
		The screen will show PR / 01
		Set the required parameter on the screen using button 3 or 4
		Set the parameter PR / 15 using button 3 or 4
	2s	Switch the boiler to the value setting mode by simultaneous pressing of buttons 3 and 5 for a period of approx. 2 s.
		Using buttons 3 or 4 set the value of the required K-factor on the screen.

Screen	Button pressing time	Description
		For switching back without changing the parameters simultaneously press down buttons 4 and 5.
	Press shortly	To confirm the set value press shortly button 5 on the main switch
	10 s	To exit the setting mode simultaneously press down buttons 3, 4 and 5 for 10 s

5.3.8 Shifting of the heating curve (Opentherm)

Shifting of the heating water output temperatures. While the K-factor will set the slope of the heating curve, shifting of the heating curve will increase or reduce the heating water output temperature within the entire regulation range by the set value. The set value is in °C. The maximum setting range is - 15°C to + 15°C.

Screen	Unit	Description
		Switching is done when the boiler is turned on
	°C	Using buttons 3 and 4 set the value of the required heating curve shift on the screen

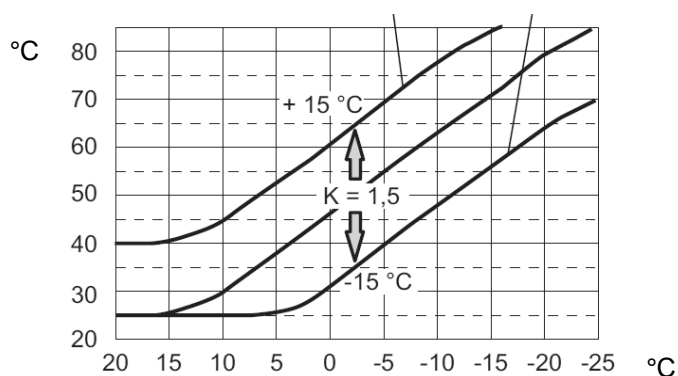
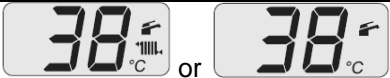
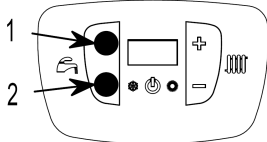

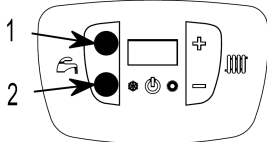
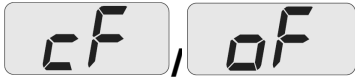


Diagram no. 4 Shifting of the heating curve

5.3.9 The „***“ (tri star) mode for hot water preheating

This is used to accelerate the start of hot water heating on the versions that are equipped with a flow-type heater. (K4G2S24XX), during operation the boiler is kept at an increased temperature so that the time necessary for hot water heating is reduced to minimum. In certain situations the „***“ mode may increase gas consumption.







Screen	Description
	Switching is done when the boiler is turned on
	Simultaneously press down button 1 and 2
	The „***“ preheating system is activated
	Simultaneously press down button 1 and 2 to deactivate the system
	The „***“ preheating system is deactivated






5.4 Failures

5.4.1 Failures shown on the boiler screen

The boiler is equipped by diagnostics for troubleshooting. The description of errors is stated further in the tables. Failures might be divided into 3 categories:

- Failures which do not require resetting and after their correction, the automatics will switch over to operational state without operators' action;
- Failures which require operators' action after their correction (short pressing of the main I/O switch);
- Failures which might be corrected by authorised service only.

Display	Description
Er 01 + RESET	Blocking – unsuccessful igniting of the boiler
Er 02 + RESET	Blocking – switching safety thermostat off
Er 03 + RESET	Blocking – unspecified failure
Er 04 + 	Pump failure or low pressure in system
Er 05 + 	Failure of fan revolutions control
Er 06 + 	Failure of NTC sensor of heating water
Er 07 + 	Failure of NTC sensor of HW
Er 08 + 	Failure of external sensor
Er 09 + 	Interruption of the flue gas sensor line

Display	Description
Er 10 + RESET	Blocking of the flue gas temperature sensor due to high temperature of the flue gas (120 °C)
	Failure of flame indication (symbol is flashing)
Er 12 + 	Failure of NTC sensor of return water (not used)
Er 13 + 	Temperatures difference higher than 40 °C
Er 14 + RESET	Blocking – pump failure or temperature reached more than 105°C
Er 14 + 	Temperature increment overreached the limit (>2 °C/s)
Er 19 + 	Failure of NTC sensor of HW inlet (if it is installed)
Er 69	Failure of boiler electric connection
Li	Limitation of NTC sensor during HW heating up

6. Maintenance

Before cleaning always turn off the equipment.

The plastic cover of the product does not require any extensive maintenance. The cover of the boiler can be wiped off by a dry cloth or by a cloth dipped in a detergent lotion. Never use solvents or abrasive agents for cleaning of the boiler surface.

All maintenance can be performed only by the contracted servicing organization trained by the manufacturer.

The user is obliged to ensure regular inspection of the gas boiler once a year. When these conditions are not observed, the user cannot claim warranty repairs.

Use only original spare parts approved by the manufacturer in order to ensure safety and long service life of the boiler.

7. IMPORTANT NOTICES

- Boiler installation and setting can be performed only by a servicing organization trained by the manufacturer.
- The boiler can be used only for the purpose for which it has been designed.
- Only adult persons are allowed to operate the boiler in compliance with this manual.
- The boiler is not designed for the use by persons (incl. children) whose physical, sensual or mental disability or lack of experience and knowledge prevent them from a safe use of the appliance unless they are supervised or if they were not instructed on the use of appliance by a person responsible for their safety.
- Children should be supervised in order to ensure that they do not play with the appliance.
- The boiler is fully automatic therefore we do not recommend disconnecting it from electric power.
- The boiler is equipped with automatic anti-freezing protection (if electric power is supplied).
- It is forbidden to intervene with any secured parts.
- No flammable objects can be placed, built or suspended near the boiler and flue gas ducting (a safe distance of the appliance from flammable materials in the main radiation direction is 50 mm and 10 mm in other directions).
- If any building reconstructions are performed in the close vicinity of the boiler, turn off the boiler with a sufficient lead time and protect it from polluting.
- Avoid cleaning of the boiler by flammable or explosive agents.
- In winter (if leaving for a holiday, for instance) it is necessary to ensure the necessary inspection of functionality of the boiler and the entire heating system in order to avoid possible water freezing resulting in equipment damage due to some external reasons (such as electricity or heating gas supply outage, and so on).
- The manufacturer recommends the use of antifreeze Alphi 11 manufactured by Fernox or X500 manufactured by Sentinel approved for the Sermet heat exchangers.
- In case of boilers with flue gas exhaust into the surrounding environment through the peripheral external wall of the building it is necessary to check whether the condensed water from flue gas in the exhaust basket does not freeze in a frosty weather.
- The boiler is fed with 230 V/50 Hz electric power supply.
- In case of fire, extinguish the boilers as electric equipment.
- Pay attention to any gas leakage (in case of any suspicion of gas leakage, shut off the gas intake and ventilate the area - call a service firm). The gas valve under the boiler must always be kept freely accessible.
- It is necessary to avoid combustion air pollution with halogen hydrocarbons (contained, for example, in sprays, solvents, paints, glues) and with dust.
- During assembly, installation and operation of the appliance it is necessary to comply with the standards that apply in the relevant country of destination.

If you fail to meet these conditions you cannot require guarantee repairs.

8. Instructions for Product Disposal After Its Service Life

VIADRUS a.s. is a contractual partner of EKO-KOM a.s., its client number being EK – F00060715
Packaging is in compliance with EN 13427.

We recommend disposing the packaging in the following way:

- plastic foils, carton cover, use the Scrap Materials
- metal binding strip, use the Scrap Materials
- the wood base is intended for single using and it cannot be further reused. Its disposal is subjected to Act No. 477/2001 Coll. and 185/2001 Coll. as amended.

We recommend disposing the individual boiler parts as follows:

- exchanger, use the Scrap Materials
- pipe distributions, use the Scrap Materials
- other metal parts, use the Scrap Materials
- boiler frame insulation material, through a contractor dealing with waste collection and disposal

Upon losing the utility value of the product, it is possible to return the product back (if applicable), in case the originator states it is waste, the waste should be disposed according to the provisions of the effective legislation in the particular country.

9. Warranty and Liability for Defects

VIADRUS SpA provides an extended warranty on the NAOS boilers for 72 months from the date of putting into operation and a maximum of 76 months from the date of shipment from the VIADRUS a.s.

Within this warranty the manufacturer agrees to remove the defects of the product in the form of a repair free of charge.

In order to recognize the warranty the manufacturer requires:

- commissioning of the NAOS condensing gas boiler by an authorized servicing organization contracted by the manufacturer. The contracted servicing organization is obliged to send a notification on commissioning of the NAOS condensing gas boiler in writing to the manufacturer not later than 20 days upon commissioning to the following address: VIADRUS a.s., Bohumín, Bezručova 300;
- in accordance with act no. 458/2000 Coll. "on the Conditions for Doing Business and Exercising State Administration in the Energy Sectors and amending certain acts (the Energy Act) and ČSN 38 6405 change 1 5/99, EN 1775 to inspect the gas boiler on a regular basis once a year. The inspections can be performed only by an organization (contacted servicing organization) authorized by the manufacturer, i.e., by VIADRUS a.s. The contacted servicing organization is obliged to record and document all records on the implemented warranty and after-warranty repairs and on the execution of the regular annual inspections of the boiler in the annexure to the warranty sheet in this manual.

Each defect shall be reported immediately after its detection, always by phone as well as in a written form.

A failure to meet the specified instructions shall result in cancellation of the warranty by the manufacturer.

The warranty does not apply to:

- defects caused by improper assembly and improper attendance of the product and defects caused by improper maintenance, see chap. 6;
- defects and damages caused by failure to observe water quality in the heating system, see chap. no. 10.1 and 10.4;
- defects caused by failure to observe the instructions specified in this manual;
- product damage in the course of transport or another mechanical damage;
- defects caused by unsuitable storage (for example water);
- consumables, i.e. electrodes, water/gas seal and fuses.
- defects caused by natural disasters or force majeure.

The manufacturer reserves the right for changes performed within the product innovation process which are not necessarily contained in this manual.

10. Placement and Installation

10.1 Standards and regulations

The heating system shall be filled with water meeting the requirements of ČSN 07 7401 and especially the water hardness shall not exceed the required parameters.

Recommended values		
Hardness	mmol/l	1
Ca ²⁺	mmol/l	0,3
Concentration of total Fe + Mn	mg/l	(0.3)*

*) recommended value

a) to the heating system

ČSN 06 0310	Heating systems in buildings – Designing and installation
ČSN 06 0830	Heating systems in buildings – protecting device
ČSN 07 7401	Water and steam for thermal energy equipments with working pressure up to 8 MPa.
EN 15502-2-1	Gas-fired central heating boilers. Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW
EN 677	Gas – fired central heating boilers – Specific requirements for condensing boilers with a nominal heat input not exceeding 70 kW

b) to the chimney

ČSN 73 4201	Chimneys and flue gas ducting– designing, implementation and connection of fuel consumers.
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c) regarding the fire regulations

ČSN 06 1008	Fire safety of heat installations.
EN 13501-1 +A1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests

d) to the system of HWS heating

ČSN 06 0320	Heating systems in buildings – Hot water preparation – Designing and planning
ČSN 06 0830	Heating systems in buildings – Safety devices.
ČSN 75 5409	Water installations inside buildings.

e) regarding the electric network

CSN 33 0165	Electrical regulations. Identification of conductors by colours or numerals. Procedure provisions
ČSN 33 1500	Electrical regulations; revision of electrical equipments
ČSN 33 2000-1 ed. 2	Low-voltage electrical installations – Part 1: Fundamental principles, assessment of general characteristics, definitions.
ČSN 33 2000-4-41 ed. 2	Low voltage electrical installations - Part 4- 41: Protection for safety - Protection against electric shock
ČSN 33 2000-5-51 ed. 3	Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules
ČSN 33 2000-7-703 ed.2	Electrical installations in buildings - Part 7-703: Single-purpose equipment and equipment in special buildings - Rooms and cabins with sauna stoves.
ČSN 33 2130 ed. 2	Low-voltage electrical installations – Internal electric distribution lines
ČSN 33 2180	Electrical regulations: Connection of electric instruments and appliances
ČSN 34 0350 ed. 2	Safety requirements for flexible cords and cables
EN 60079-10-1	Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres
EN 60079-14 ed.3	Explosive atmospheres - Part 14: Electrical installations design, selection and erection
EN 60252-1 ed. 2	Capacitors for AC motors – Part 1: In general – Design, testing, dimensioning – Safety requirements – Instructions for installation and operation.
EN 60 335-1 ed.2	Electric appliances for household and similar purposes – Safety – Part 1: General requirements
EN 60 335-2-102	Electric appliances for household and similar purposes – Safety – Part 2-102: Special demands on appliances containing the electric connections and burning the gas, oil and solid fuels
EN 60445 ed. 4	Basic and safety principles for man-machine interface, marking and identification – Identification of equipment terminals, conductor terminations and conductors

f) to the gas distribution

EN 1775	Gas supply. Gas pipework for buildings. Maximum operating pressure less than or equal to 5 bar. Functional recommendations
EN 12007-1	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 1: General functional recommendations
EN 12007-2	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 2: Specific functional recommendations for polyethylene (MOP up to and including 10 bar)
EN 12007-3	Pipelines for maximum operating pressure up to and including 16 bar - Part 3: Specific functional recommendations for steel
EN 12007-4	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 4: Specific functional recommendations for renovation
ČSN 07 0703	Boiler room with gas fuel –operated equipments
ČSN 38 6405	Gas equipments. Operating principles
EN 15001-1	Gas supply systems Pipelines for operating pressure greater than 0,5 bar for industrial use and pipelines for operating pressure greater than 5 bar for industrial and non-industrial use - Part 1: Detailed functional requirements for design, materials, construction, inspection and testing
Act No. 458/2000 Coll.	on Business Conditions and Public Administration in the Energy Sectors and on amending certain acts (the Energy Act)

10.2 Possible Placement

The installation and operation of the boiler shall comply with all requirements of ČSN 06 1008.

The boiler placement shall comply with the project documentation. The flue gas exhaust shall comply with the valid regulations. Ports of individual pipes for supply of combustion air and discharge of flue gases shall be located in such a way that they are located inside a square with a side of 50cm by the boiler. The boiler can be placed on a wall with ensured loading capacity only.

At least 0.2 m shall be left free beside the boiler and above the boiler and **at least 1 m** shall be left free in front of the boiler for assembly and repairs. **The manufacturer recommends placing these products in closed heating systems.**

The boiler also can be placed in a room with the basic environment according to ČSN EN 33 2000-1 ed 2.

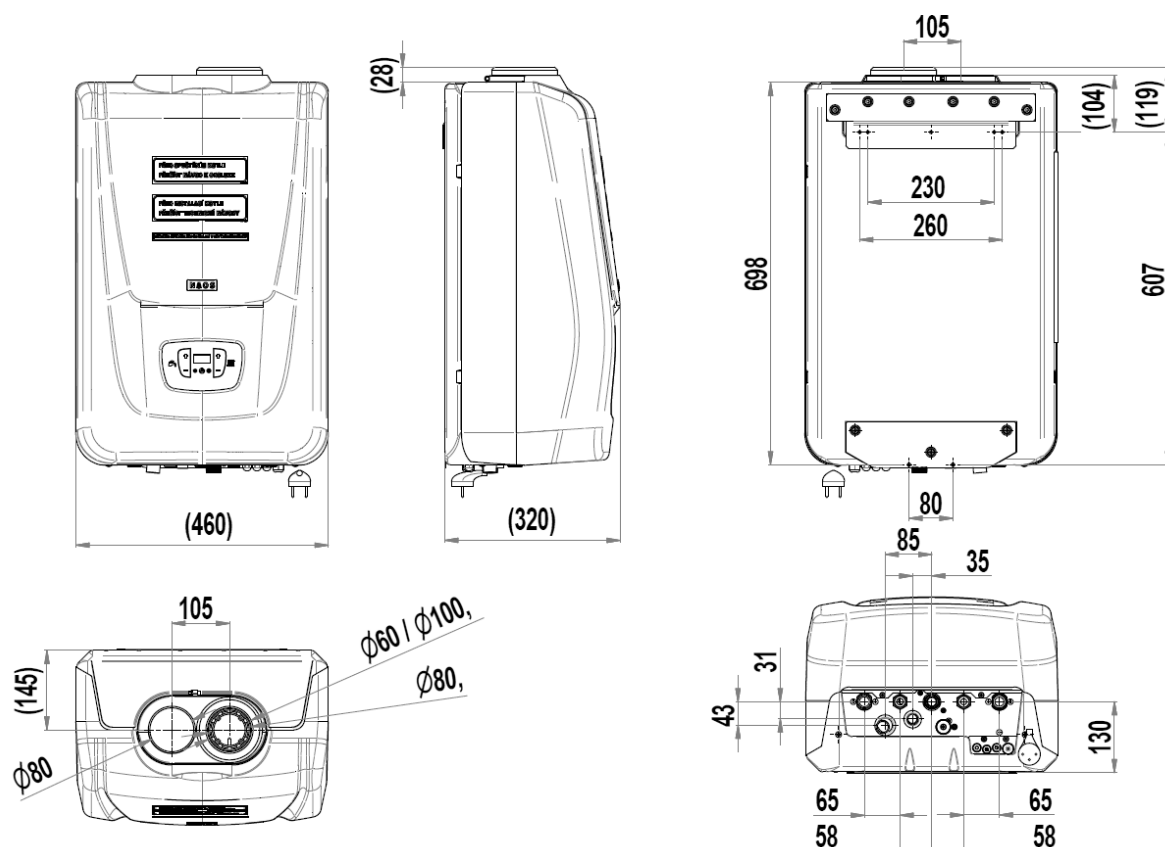


Fig. no. 9 Main dimensions of the boiler

Placement of the boiler with respect to fire regulations:

A safe distance from flammable materials:

- when installing and operating the boiler it is necessary to keep a safe distance of 200 mm from the materials of combustibility grade A1, A2, B and C (D);
- for easily combustible materials of combustibility grade E (F), which quickly burn and burn themselves even after removal of ignition source (such as paper, cardboard, asphalt and tar paper, wood and woodfiber boards, plastics, floor coverings) the safe distance has to be doubled, i.e. to 400 mm;
- safe distance should be doubled also where the grade of reaction to fire has not been proved.

A safe distance from surfaces of materials with individual degrees of flammability and information of the flammability degree of common building materials, if necessary, for appliances which can be operated in the immediate vicinity of walls made of flammable materials will be defined with the maximum permissible temperatures of surface or wall temperature increase according to ČSN EN 13 501 – 1 + A1.

Grade of reaction to fire

Grade of reaction to fire	Examples of building materials and products included in the reaction to fire (Extract from ČSN EN 13501-1 + A1)
A1 – incombustible	granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters, ...
A2 – combustible with difficulty	acumin, izumin, heraklit, lignos, boards and basalt felt, fibreglass boards,...
B – hardly combustible	Beech and oak wood, hobrex boards, plywood, werzalit, umakart, sirkolit,...
C (D) – medium combustible	Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,...
E (F) – easily combustible	Asphaltboard, fibreboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,...

10.3 Boiler Installation

Using the installation stencil (the stencil is printed at the bottom of the carton packaging of the boiler) attach the enclosed bracket to the wall using 3 pieces of dowels with diameter of 8mm and bolts. Mount the NAOS K4 boiler on the bracket and using the marked outlets the boiler is connected to the heating system incl. hot water (if used) and gas distribution pipe according to Fig. no. 10. The connection of condensate outlet should be in compliance with the effective valid ČSN and EN standards. Then the flue gas exhaust is connected according to the project documentation. Remove the protection foil from the front cover.

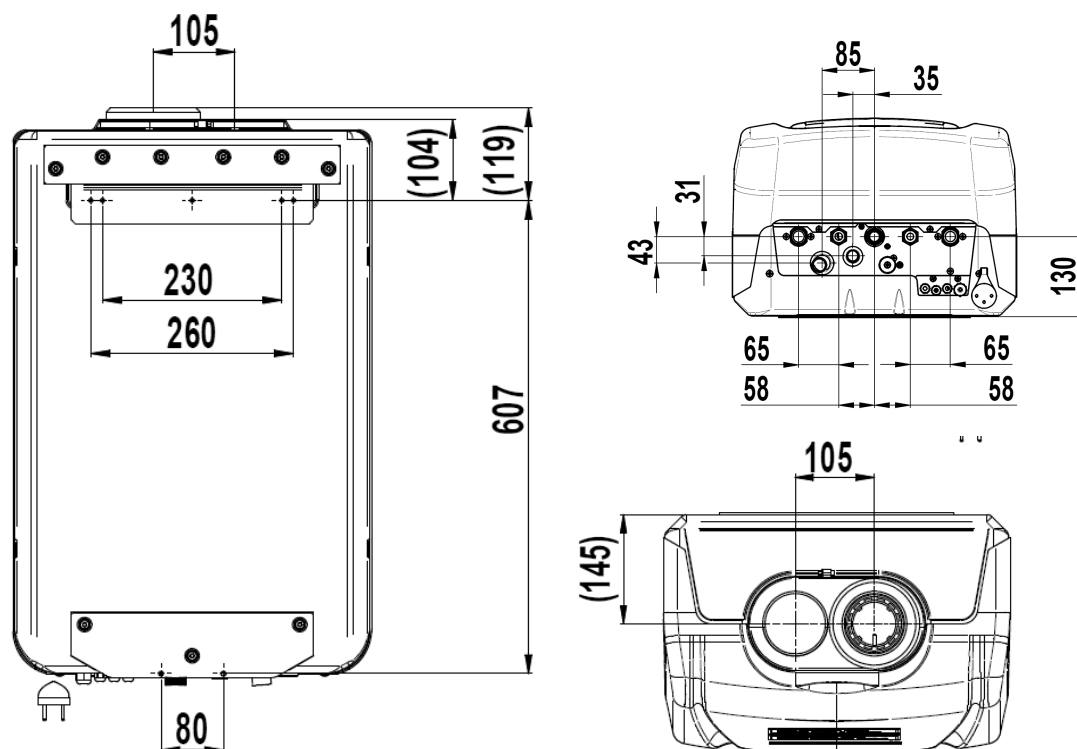


Fig. no. 10 Mounting bracket, connecting dimensions

Servicing

NOTICE: The manufacturer recommends installing water filter to the heating system.

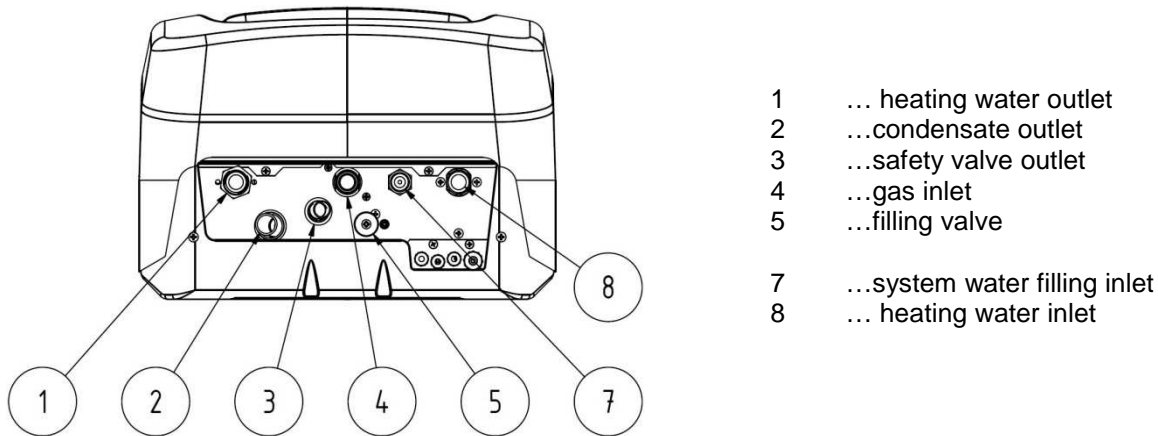


Fig. no. 11 NAOS K4G1S24XX – Boiler connections, bottom view of the boiler

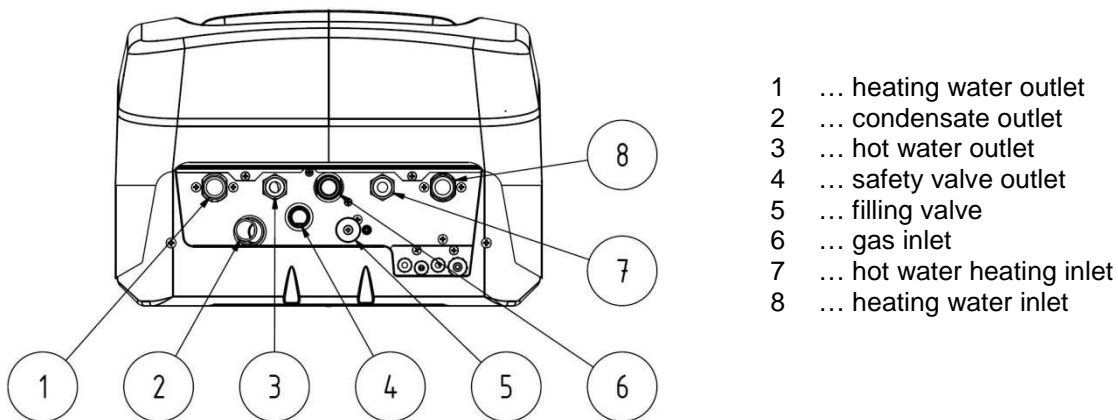


Fig. no. 12 NAOS K4G1S24XX –Connections of the boiler with a flow type heater, bottom view of the boiler

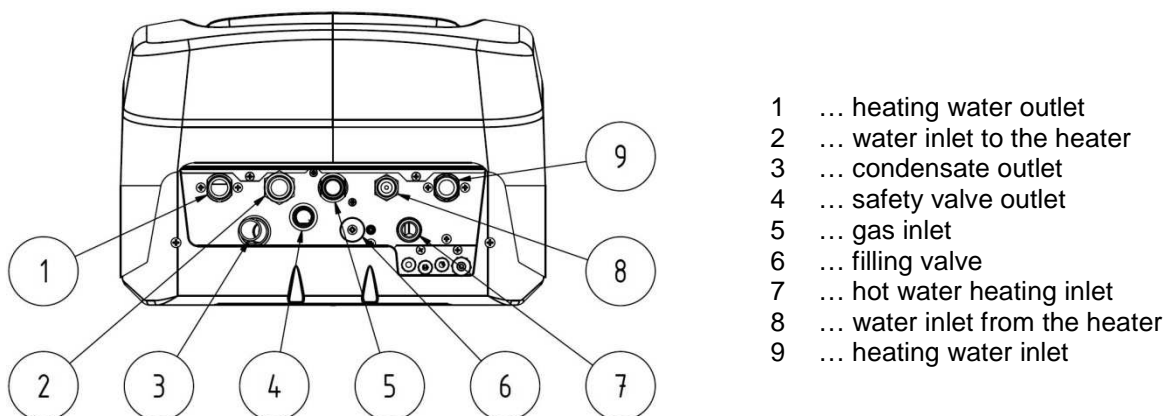


Fig. no. 13 NAOS K4G1S24XX – Connections of the boiler with a reservoir type heater, bottom view of the boiler

The expansion tank capacity is 10 liters. This volume is enough for approx. 150 l of water in the heating system.

The system should be designed for a temperature gradient of 50/30 °C due to the use of condensation. The condensing boiler can also be used for old gravitational systems that usually were oversized and thanks to this fact condensation can be efficiently used even for this system but it is necessary to expand this system with a corresponding expansion tank.

The condensing boiler is equipped with a Willo three-speed pump. Setting of the pump speed shall correspond with the requirements of the heating system so that the hydraulic system is balanced. Connecting to the HSW heating system and to the gas pipe is implemented through ball valves.

10.4 Connecting to the Heating System and Water Filling

Water for filling the boiler and the heating system must be clear and colorless, with no suspended substances, oil and chemically aggressive substances. The parameters of circulation and refilling water shall meet:

The highest permissible heating water values according to ČSN 07 7401

Hardness	(mmol/l)	1
Ca ²⁺	(mmol/l)	0.3
Concentration of total Fe + Mn	(mg/l)	(0.3)*

* a recommended value

When the water hardness does not meet the required parameters, it shall be treated accordingly. Several times reheated water with a higher hardness does not prevent precipitation of salts on the walls of the boiler body. The precipitation of limestone decreases the heat transfer from metal to water at the particular point by 10 %.

During the heating season it is necessary to keep a constant volume of heating water in the heating system and be particular about bleeding the heating system. The water from the boiler and the heating system shall never be discharged or taken for some other use except in cases of emergency like repairs etc. Draining of the heating water and filling new water increases the danger of corrosion and scaling. **If it is necessary to refill water into the heating system, then add water only when the boiler is cold.**

When adding water to the boiler, the system shall be disconnected from electric power supply. The bleeding valve on the boiler and on the heating system shall be functional and open. Adjust the expansion reservoir to a pressure which is higher by 10 kPa than the required pressure in the heating system. The system will be pressurized to the required pressure of approx. 100 kPa and it will be vented again. We recommend using the filter on the inlet to the heating system for water filling.

The heating system shall have a sufficient number of venting points. The lowest point of the heating system shall be equipped with a drain valve.

10.5 Gas Connection

Prior to connecting the gas pipeline to the boiler, the gas pipeline shall be tested and subjected to revision inspection. After connecting the boiler to gas pipeline, all gas connections shall be tested again by means of a detector or foaming solution. The input pressure of natural gas shall correspond to the value in table no. 1.

10.6 Electric Power Supply Connection

The boiler is equipped with a flexible mains supply and a plug. According to ČSN EN 60 335–1 ed. 3 the boiler shall be placed in such a way that ensures that the plug is freely accessible.

A 230 V/50 Hz socket should be located beside the boiler within a distance of 1.5 m. The socket shall correspond to the effective regulations and it shall be subjected to revision inspection.

10.7 Condensate Discharge

A built-in siphon (trap) serves as the condensate outlet. It must be connected to a sewerage overflow. Prior to the commissioning of the boiler, it is necessary to check whether the condensate is being drained. The size of a PVC drain pipe is Ø 16mm. The pH value of this condensate is < pH 3 and it can be discharged to the sewerage.

The boiler condensate outlet shall be implemented in such a way that ensures that it does not prevent fluent discharging of the condensate.

The boiler is equipped with an odor trap (siphon) that needs to be filled with approx. 100 ml of water before starting of the boiler. Discharging of the condensate to the sewerage is governed by the national or regional (local) regulations. The drain pipe inclination shall be at least 5° from the boiler to the sewerage and it shall not be blocked in any way (when the condensate drain pipe is blocked, the boiler furnace will resonate).

10.8 Flue Gas Ducting

See chapter 11 - Flue Gas Ducting

10.9 Boiler Electrical Wiring

10.9.1 Main components of boiler electrical equipment

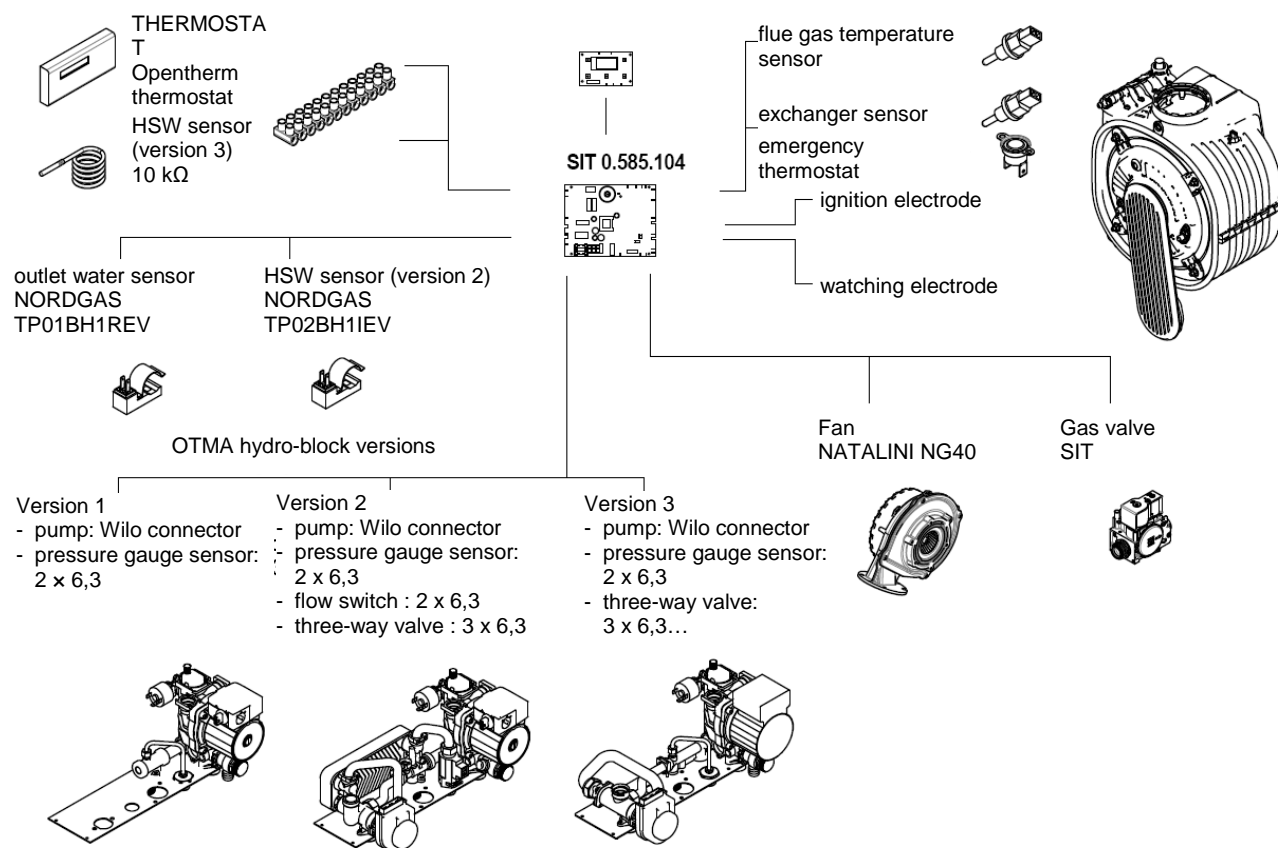


Fig. no. 14

10.9.2 Connection of the higher-level regulation and external boiler sensors

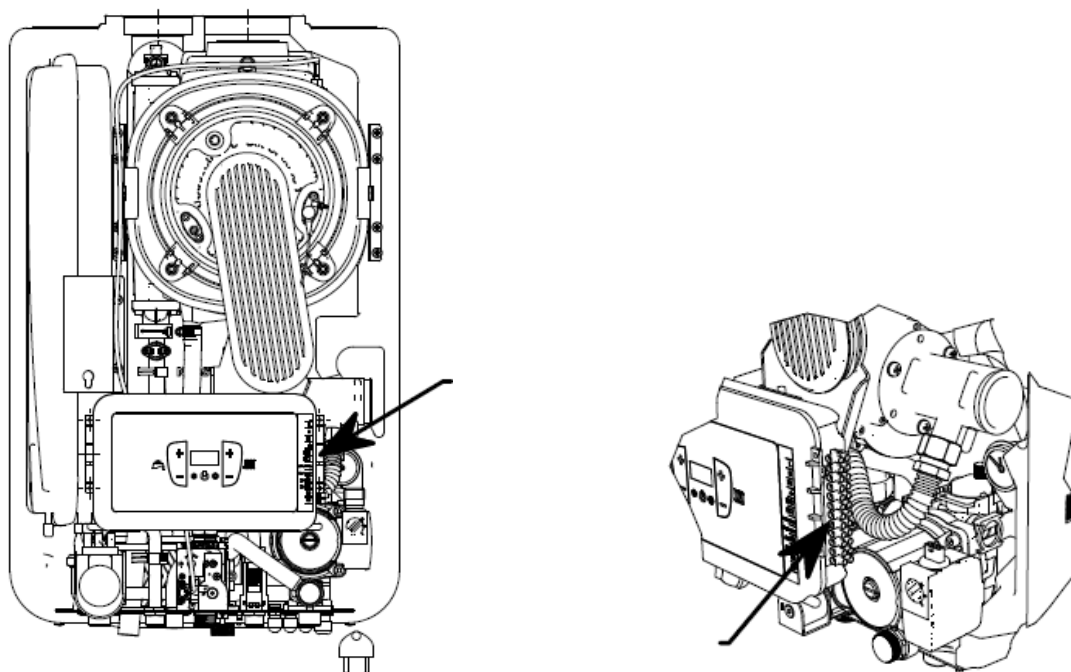


Fig. no. 15 Terminal for a boiler

10.9.3 Connecting terminal

Wiring of the connecting terminal for a boiler without higher-level regulation (standard delivery of the boiler):

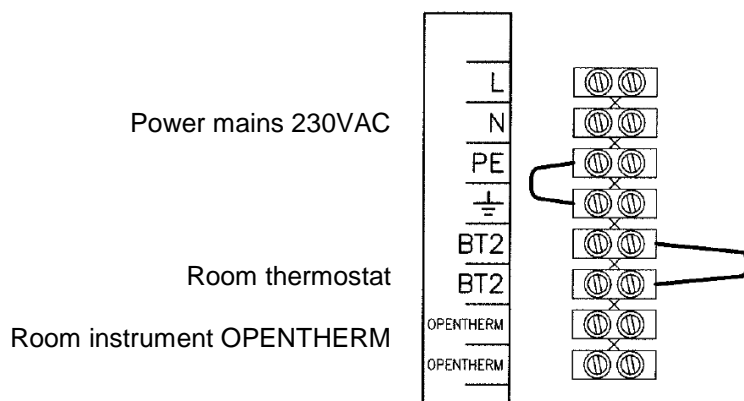


Fig. no. 16

Wiring of the room thermostat:

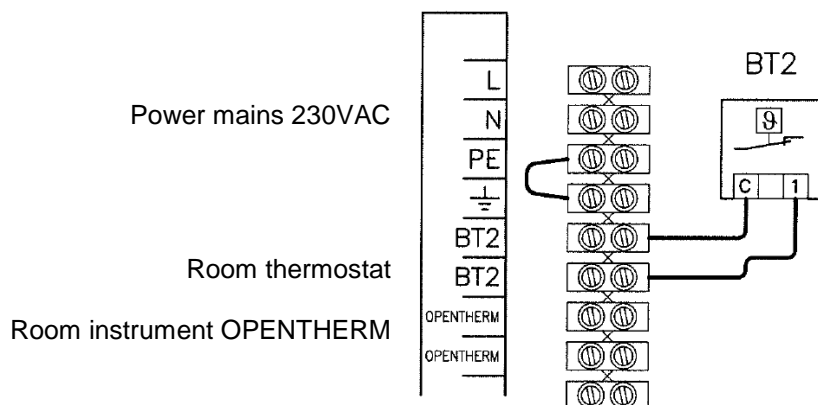


Fig. no. 17

Wiring of the higher-level regulation – regulator with OPENTHERM communication:

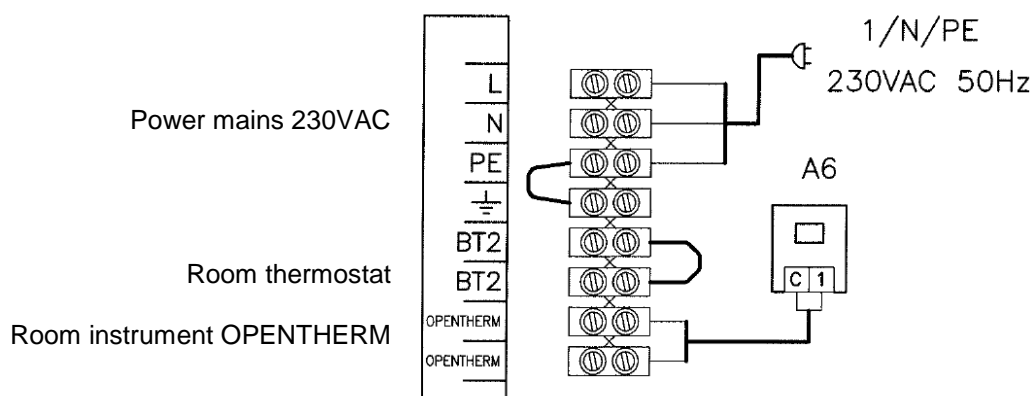


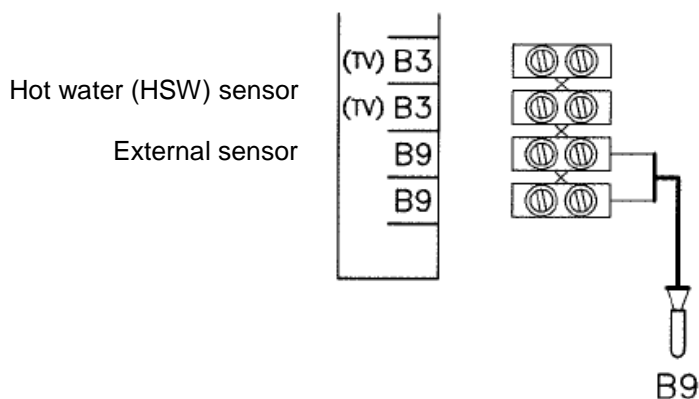
Fig. no. 18

10.9.4 Wiring of the sensors

B9

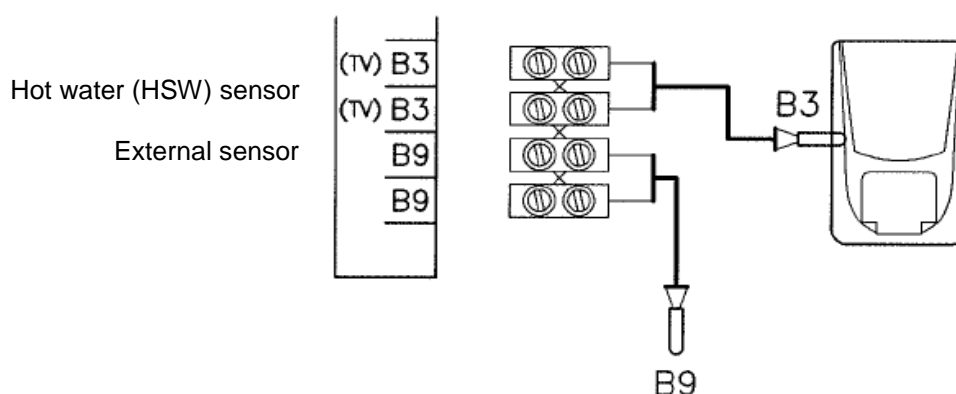
- wiring of the sensor depends on the type of the used room instrument the connection of which is necessary for using the function of equithermal regulation

Hot water sensor B3 is used only for version K4G3S24XX (reservoir).



B3

- K4G2S24XX boiler version with a flow type heater. Sensor B3 measures temperature of outlet water from the flow type heater and included in the boiler delivery.



- K4G3S24XX boiler version - hot water sensor B3 is used only for version K4G3S24XX (reservoir)

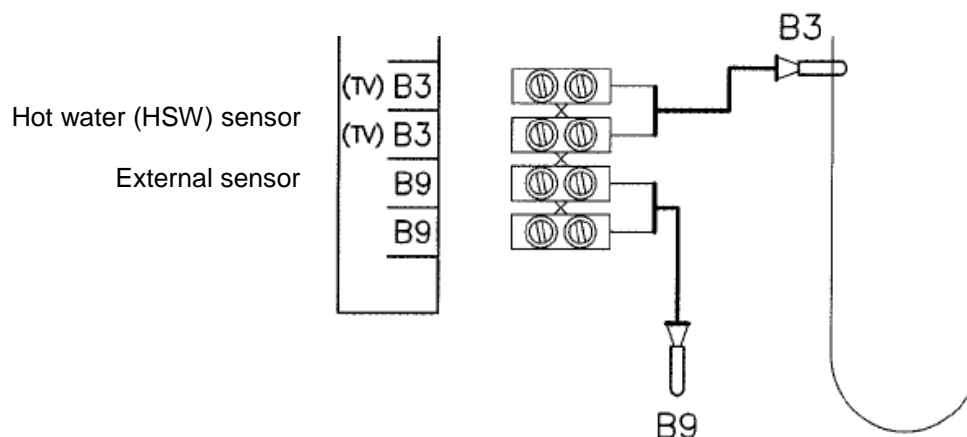
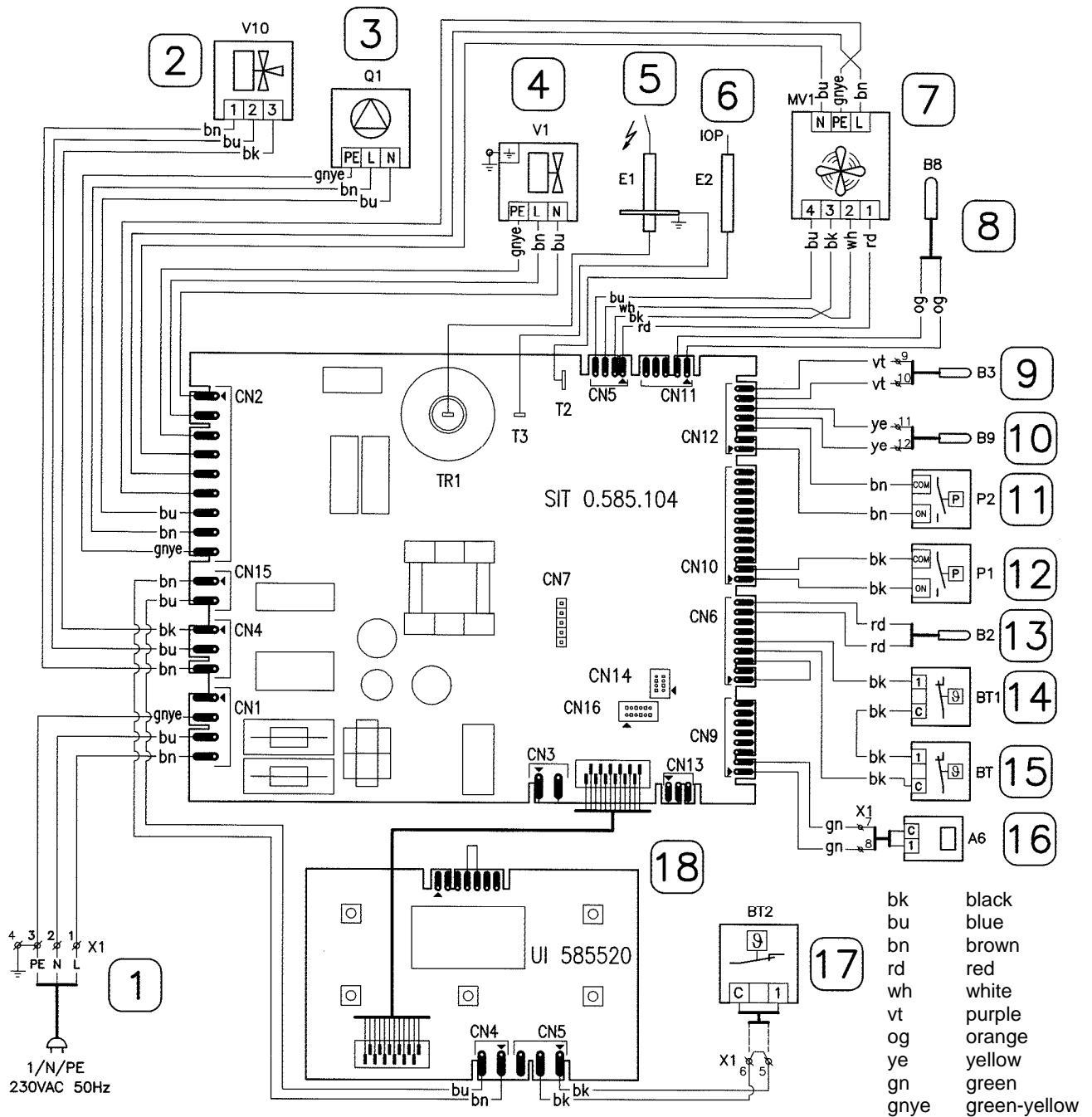


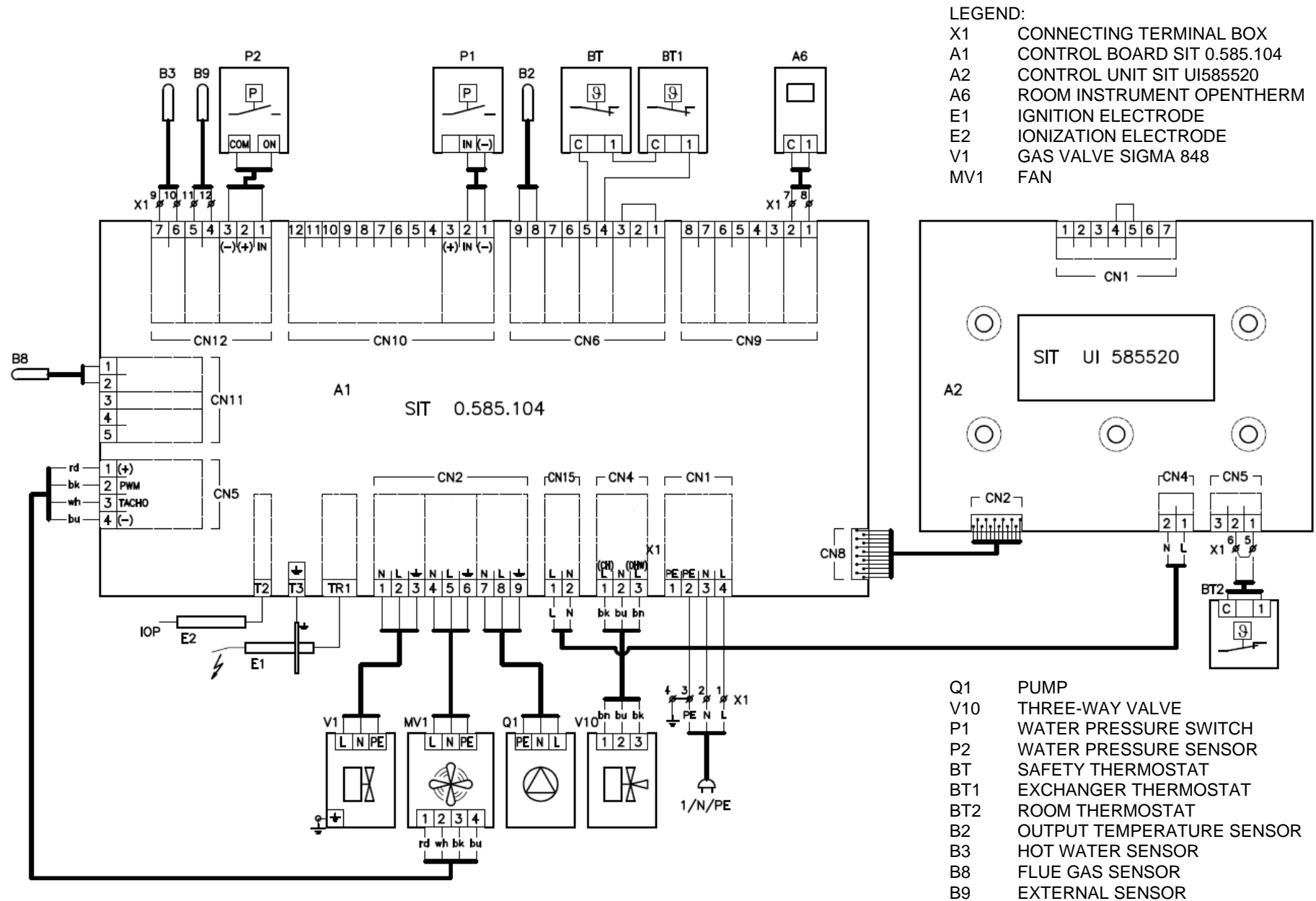
Fig. no. 19 Boiler wiring diagrams



1. Power mains 230VAC,
2. Three-way valve,
3. Pump,
4. Gas valve SIGMA 848,
5. Ignition electrode,
6. Ionization electrode,
7. Fan,
8. Flue gas sensor,
9. HSW sensor,
10. External sensor,
11. Water flow sensor,
12. Water pressure sensor,
13. Output temperature sensor,
14. Exchanger thermostat,
15. Safety thermostat,
16. Room instrument OPENTHERM
17. Room thermostat,
18. Panel with LCD screen

Fig. no. 20 Boiler electrical equipment wiring diagram

Fig. no. 21 Boiler wiring diagram



11. Flue Gas Ducting

According to the means of flue gas removal and combustion air inlet the boiler version is classified as C. this means a close appliance that takes the combustion air from the outside space or from a joint shaft and from which the flue gases are removed into the outside space or to a joint shaft. The shaft is represented by a structural part of the building, e.g., a chimney, a duct, etc. The combustion area and the flue gas ducts of the appliance are separated in a gas-tight way from the area in which the appliance is located.

In the standard version the boiler is supplied with an air flange. The boiler flue gas exhaust is not a part of the boiler delivery. It is necessary to maintain a 3 % inclination to the boiler. The pressure loss for the flue gas exhaust shall not exceed **150 Pa**. The total pressure loss is the sum total of individual losses of the parts described in this chapter.

The boiler shall only be installed together with wind protective equipment which meets the requirements of EN 1856-1 (See Annex N). For removal of flue gases through the roof it is necessary to use a concentric chimney piece.

The boiler shall be installed together with the necessary accessories (pipeline for the combustion air supply and flue gas exhaust).

The approved and recommended flue ducting versions for the NAOS K4 boiler made by ALMEVA are as follows:

- Star D80mm
- Flex D80 mm
- LIK 60/100 mm
- LIK 80/125 mm

The recommended flue ducting can be ordered together with the boiler.

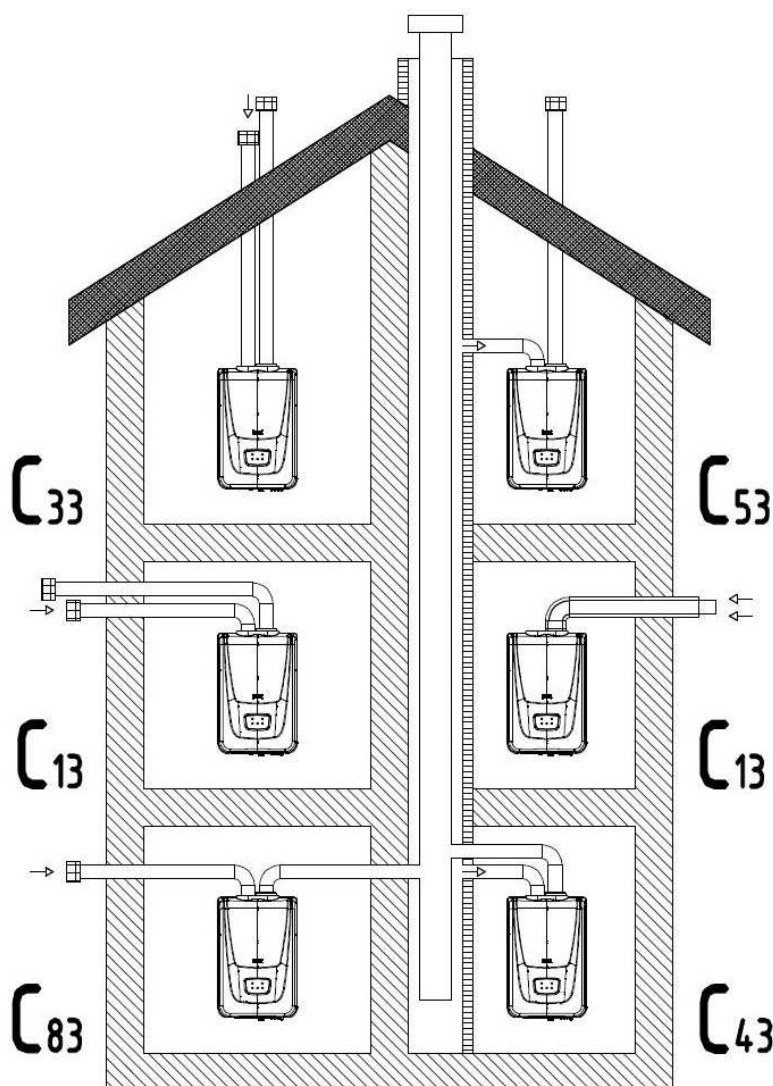


Fig. no. 22 Flue gas removal and air supply connection options

The boiler in version C is specified in more detail by a two digit number:

- The first digit in the index refers to the possible boiler installation with regard to the way of combustion air inlet and flue gas removal,
- The second digit in the index refers to the application and positioning of the built-in fan in the boiler. NAOS K4 is a boiler with a fan that is built-in before the combustion chamber/heat exchanger (boiler body) and is marked with „3“, the second digit in the index

Version C₁

A boiler in version C whose ducting is connected to the protection inlet installed horizontally either on the outside peripheral wall or on the roof of the building. Terminal outlets of these ducts are either concentric or they are located so close one to the other that they are subject to the same climatic conditions.

Outlet openings of the terminated separate ducts for supply of the combustion air and for removal of flue gases shall be located inside a square with a side of 50 cm.

The wind protection equipment can be placed on the wall and/or the roof depending on the installation.

Version C₃

A boiler in version C whose ducting is connected to the protection inlet installed vertically. Terminal outlets of these ducts are either concentric or they are located so close one to the other that they are subject to the same climatic conditions.

Outlet openings of the terminated separate ducts for supply of the combustion air and for removal of flue gases shall be located inside a square with a side of 50 cm and the distance between the planes of two openings shall be lower than 50 cm.

Version C₄

A boiler in version C whose ducting or adapter is connected to the joint shaft. Terminal outlets of these ducts are either concentric or they are located so close one to the other that they are subject to the same climatic conditions.

The boiler shall be installed with the shortest possible length of the ducts for supply of the combustion air and for removal of flue gases. By its suction effect used for ducting for removal of flue gases the boiler shall not create negative pressure of 50 Pa. This connection can be implemented using the systems made by ALMEVA.

Version C₅

The wind protection equipment on ducts for supply of the combustion air and for removal of flue gases shall not be placed on the opposite walls of building.

Version C₈

A boiler in version C whose ducting or adapter is connected on the air supply side to the protection inlet and on the flue gas removal side to a separate or joint chimney.

The chimney shall be equipped with a special lining designed for the condensing boilers and a condensate outlet from the chimney.

For the NAOS K4 boiler it is possible to use a plastic lining with temperature resistance 120 °C made e.g. by ALMEVA.

The boiler shall only be installed together with wind protective equipment which meets the requirements of EN 1856-1 (See Annex N).

Design of flue gas ducting and air supply ducts, including their lengths, shall be made by the designer in the technical documentation on the basis of design documentation provided by VIADRUS.

Note: The quantity of the components for the individual version types depends on the placement of the boiler.

11.1 Flue gas ducting – examples of correct connection of flue duct and air supply

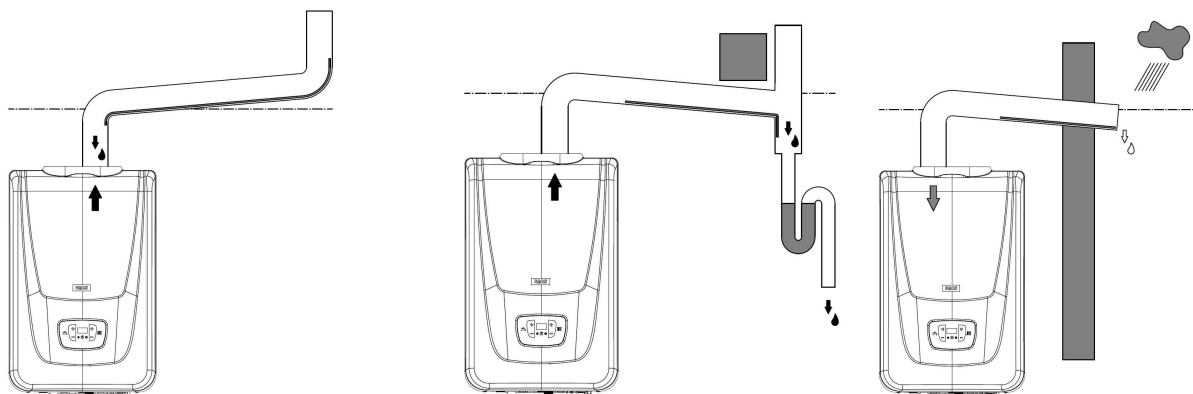


Fig. no. 23

11.2 Flue gas ducting – examples of incorrect connection of flue duct and air supply

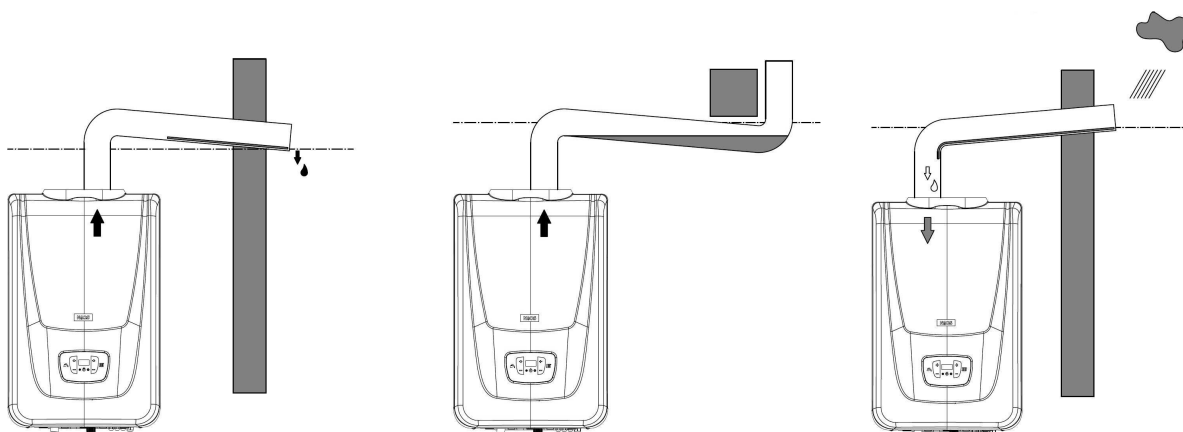


Fig. no. 24

11.3 STARR D80 and FLEX 80 system connection



- 1 exchanger reducer piece
- 2 flue gas removal, measuring piece
- 3 air supply pipe

Fig. no. 25

11.3.1 STARR, 2 x D 80 mm flue ducting diagram

Plastic chimney capital starr
(complete set)

Rain-protection collar

Terminal pipe without socket

Universal distance clamp

Pipe with socket

Inspection T-piece

Inspection door

Pipe with socket

Foot-elbow starr 87° with
anchoring

LIB pipe piece with flange

Inspection T-piece

Pipe with socket

Inspection T-piece with drainage

Elbow 45°

Inspection T-piece with change
of direction

Inspection elbow 87°

Boiler reducing piece - centric

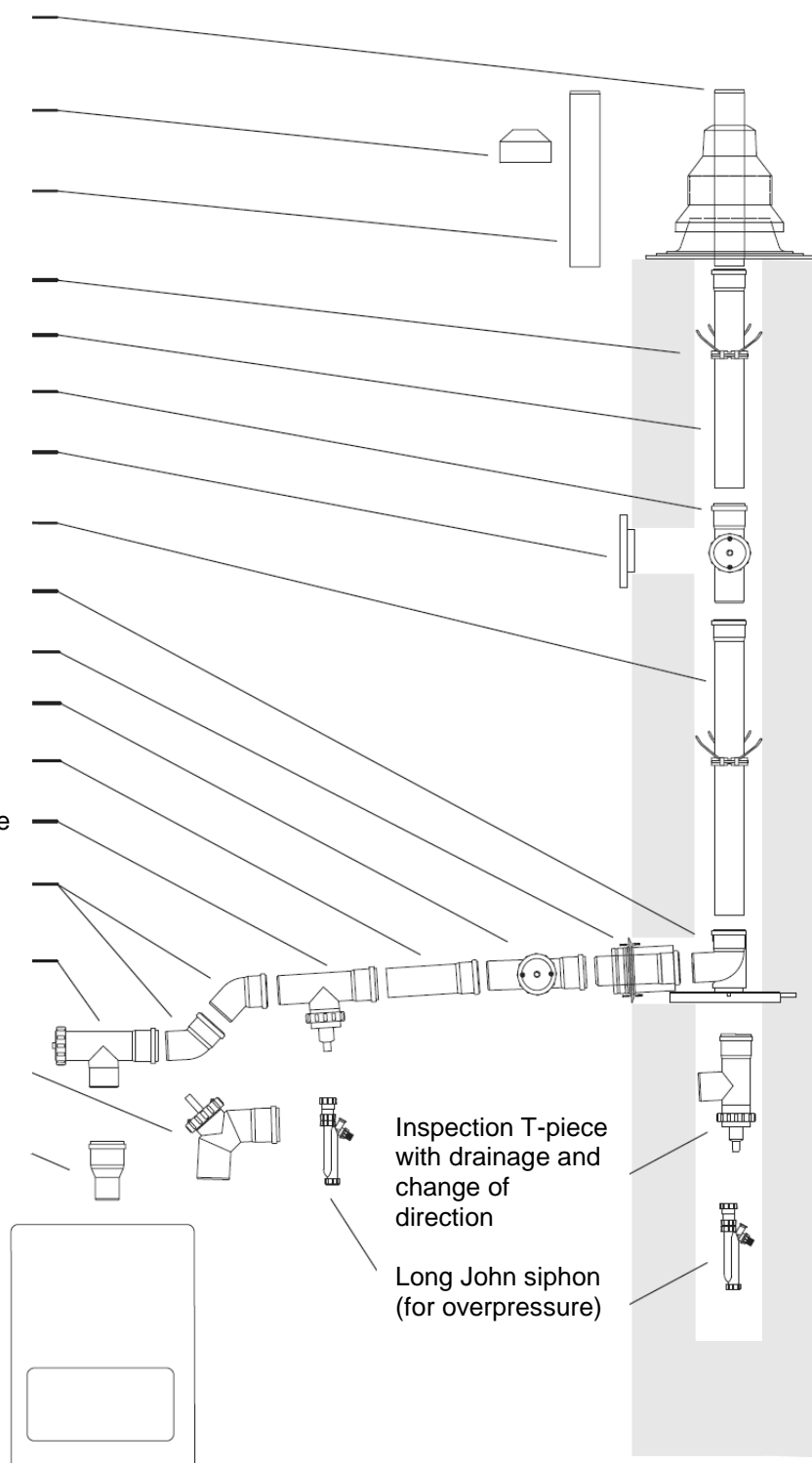


Fig. no. 26

11.3.2 FLEX, 2 x D 80 mm flue ducting diagram

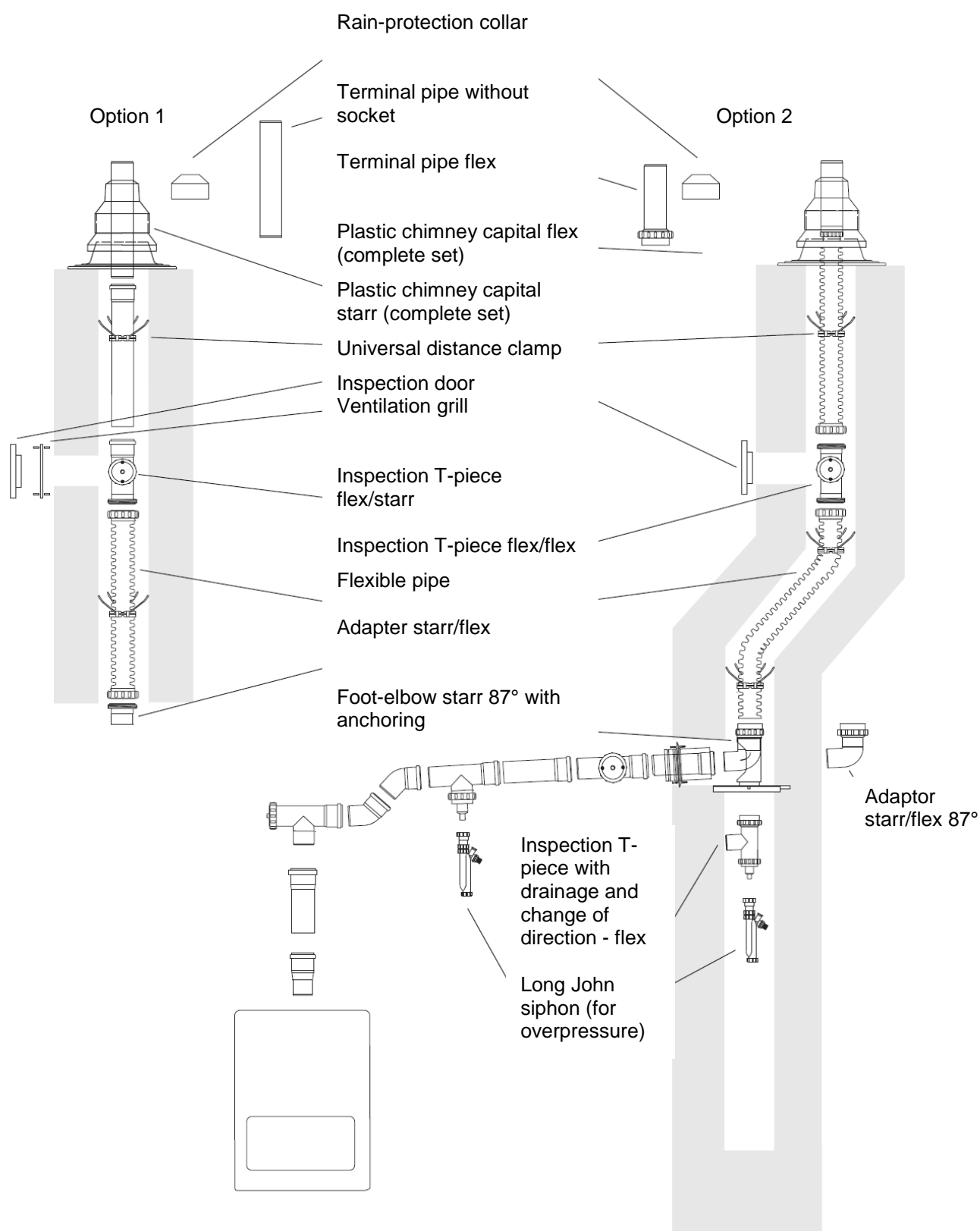


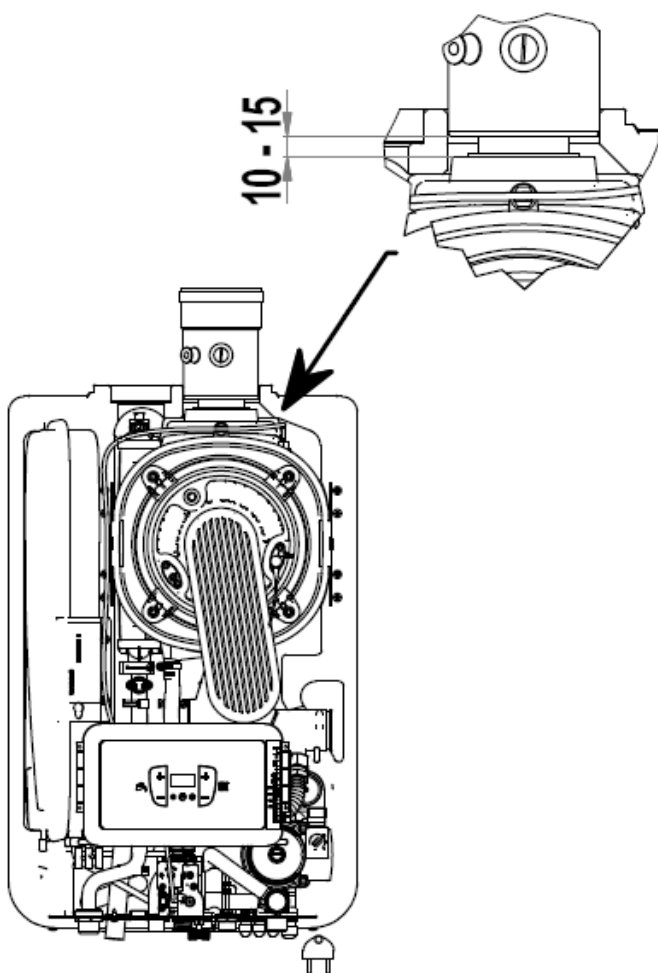
Fig. no. 27

11.4 LIK 60/100, 80/125 system connection



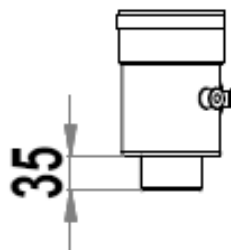
For connection of the LIK 80/125 system it is necessary to use a 60/100 reducer piece

- 4 measuring piece
- 5 blinding plug D80
- 8 exchanger reducer piece



Preparation of connection of the terminal part of the LIK system for connection to the NAOS boiler – the outside air supply pipe shall be by 35 mm shorter than the flue gas removal pipe. It is necessary to ensure a gap of 10 – 15 mm between the exchanger and the air supply pipe to ensure air supply to the boiler.

When the flue duct diameter is 80/125 mm the diameter of the connecting piece is 60/100 mm. Then the diameter needs to be converted from 60/100 to 80/125 mm.



11.4.1 Diagram for flue gas ducting of the LIK type, version 60/100 mm (max. length 5 m), or 80/120

Plastic chimney capital
starr (complete set)

LIK pipe piece with flange

Adjustable LIK pipe piece
with clamp

LIL wall clamp

LIK inspection T-piece with
measuring opening

LIK inspection T-piece with
drainage

LIK elbow 45°

LIK inspection T-piece with
change of direction and
measuring opening

LIK elbow 87°

LIK elbow 87° (short)

LIK inspection elbow
87° with measuring
opening

LIK pipe with socket

LIK measuring piece
with 2 measuring
openings

LIK boiler reducing
piece

Long John siphon
(for overpressure)

Information on availability of the goods:
The LIK – DN 60/100 system available since
October 1, 2012

Fig. no. 28

Design of flue gas ducting and air supply ducts, including their lengths, shall be made by the designer in the technical documentation.

Note: The quantity of the components for the individual version types depends on the placement of the boiler.

11.5 Pressure Losses of Chimney Flue Elements in Case of NAOS K4 Boiler Usage

Maximal pressure of fan 150Pa

Multi-piece Chimney Flue - Burnt Gases			
Code	DN	Name	Loss in Pa
PPSB48	80	Angle piece 45°	1.1
PPSB98	80	Angle piece 87°	1.7
PPRM18	80	Tube 1m	3.4
PPSAS8	80	Chimney plastic head - starr (a set]	2.5
Multi Piece Chimney Flue - Suction			
Code	DN	Name	Loss in Pa
PPSB48	80	Angle piece 45°	0.8
PPSB98	80	Angle piece 87°	1.2
PPRM18	80	Tube 1m	2.5
Concentric Chimney Flue			
Code	DN	Name	Loss in Pa
LPBK45	60/100	Angle piece 45°	5.3
LPBK95	60/100	Angle piece 87°	7.5
LPRK15	60/100	Tube 1m	21.9
LPZTK5	60/100	LIK T-piece for air inlet	5
APASK5	60/100	LIK tube piece for façade chimney flue	10.5
DPDS45	60/100	Roof extension (a set)	29.8
LPBK48	80/125	Angle piece 45°	1.5
LPBK98	80/125	Angle piece 87°	2.1
LPRK18	80/125	Tube 1m	5.4
LPZTK8	80/125	LIK T-piece for air inlet	1.5
APASK8	80/125	LIK tube piece for façade chimney flue	3.5
DPDS48	80/125	Roof extension (a set)	9.1
LPKK01	60/100-80/125	LIK boiler reducer	2

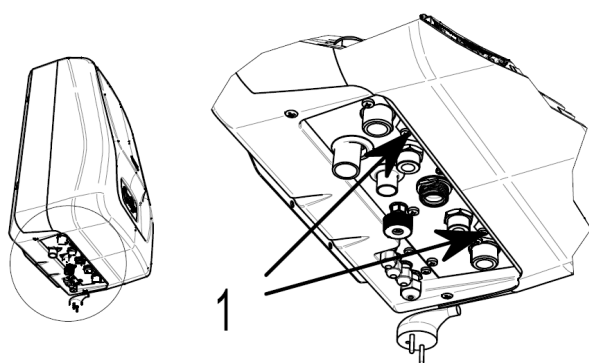
12. Commissioning

The entire installation shall comply with the regulations that are applicable for this equipment. The boiler shall be compatible with the local connecting conditions (checking the parameters of the boiler with the information on the name plate). **The boiler can only be commissioned by organizations that are authorized and trained for this purpose by the manufacturer.** The minimum pressure in the heating system is 30 kPa. It is necessary to open all closing valves and make sure that no gas is leaking. Connect the boiler to the electric power mains. Check the gas distribution line after the gas valve. Check the safety valve function. Then check the pump operation. During the operation of the boiler it is necessary to check removal of the condensate from the boiler and also from the chimney lining, if applicable.

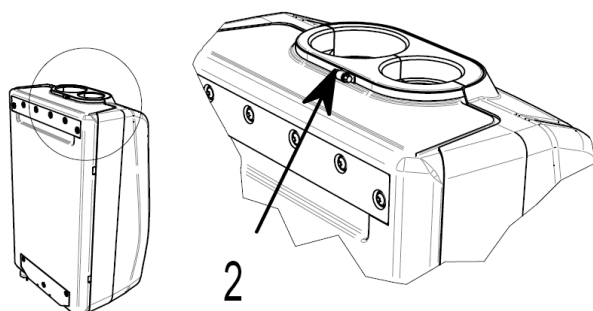
During the first start of operation of the boiler it is necessary to train the user in accordance with this manual and to hand over this manual to the user.

Then it is necessary to perform:

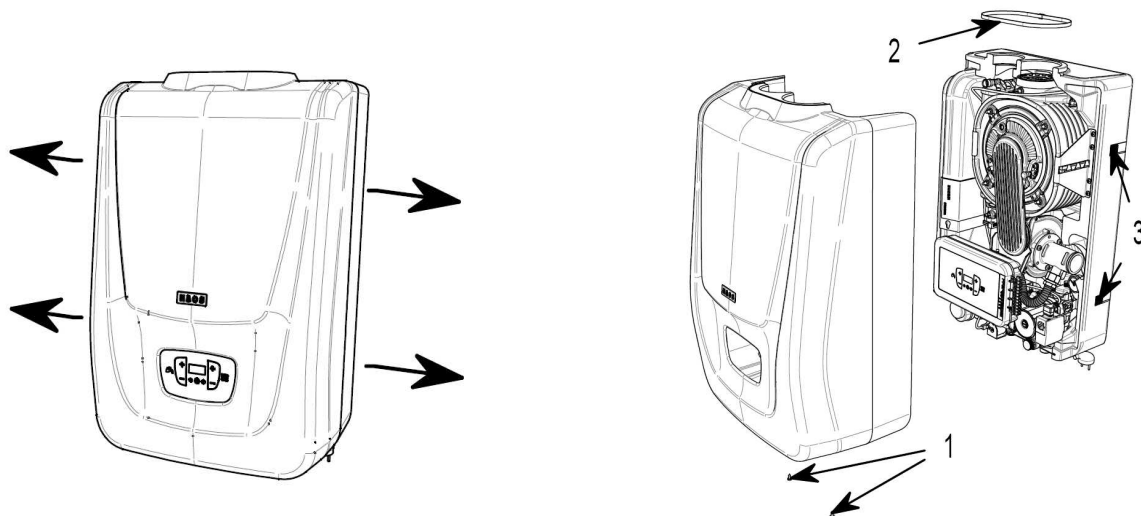
- inspection revision before commissioning,
- inspection for any water leakages,
- inspection of instrumentation and safety controls.



- Remove the bolts (1)



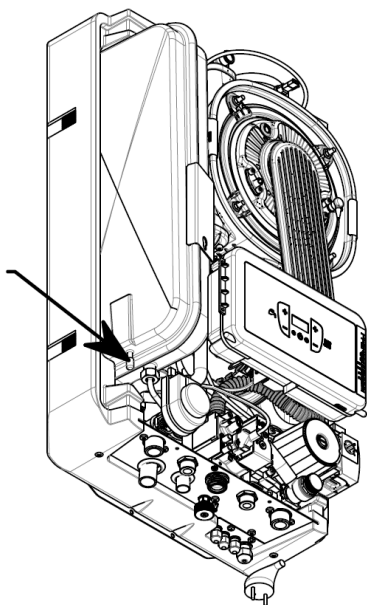
- Remove the binding strip (2)



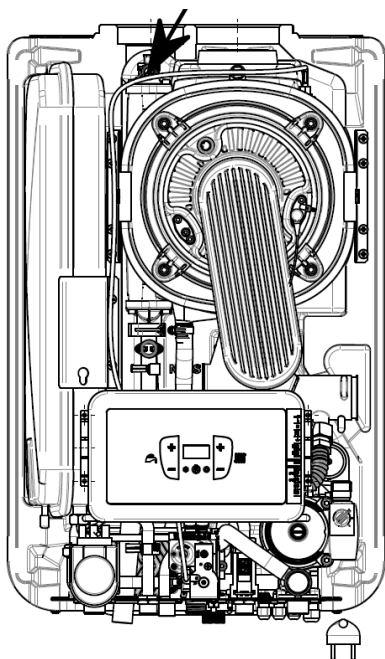
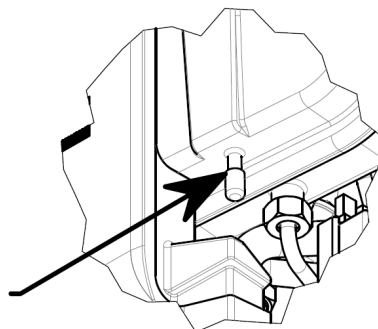
- Pulling the cover side detach the Velcro strip
- Remove the front cover

Fig. no. 29 Removing the front cover of the boiler

12.1 Instructions before Putting into Operation



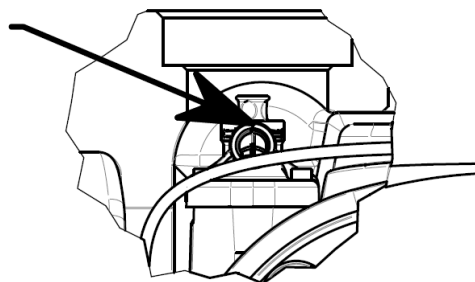
Expansion tank filling valve. Pressure in the expansion tank shall be set according to the heating system designing documentation. Pressure in the expansion tank shall be checked during the regular annual servicing inspection.

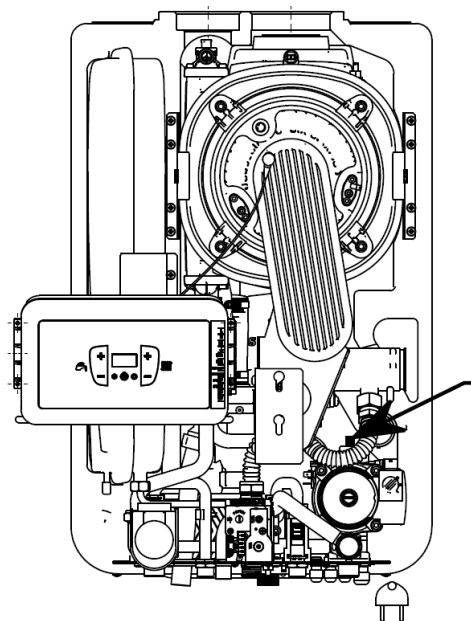


Bleeding valve of exchanger

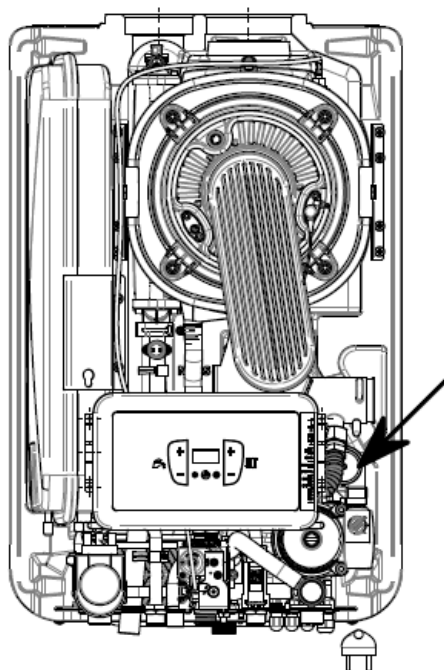
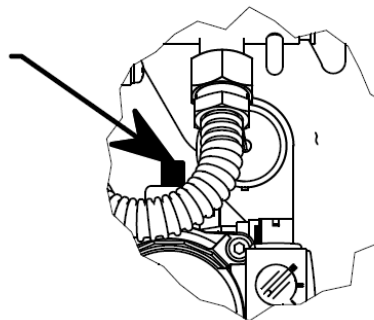
During bleeding, use for example a silicon hose of $\varnothing 6$ and a small container to protect boiler electronics from water leakage.

Loosen a screw at the valve. If the system is being bled, air starts coming out from the exchanger. At the moment when water starts coming out, the exchanger is deaerated. So the screw might be retightened. Repeat this procedure several times until the system is completely deaerated.

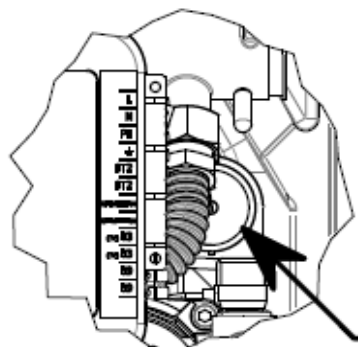




Automatic pump bleeder valve may remain permanently open.



The minimum water pressure in the heating system is 0.8 bar, max. operating pressure is 2,5 bar. When filling and bleeding the system the pressure in the heating system needs to be adjusted according to the designing documentation.



12.2 Boiler Setting

Boiler emissions:

Natural gas:

CO₂ – minimum boiler output CO₂ value – 8,5 %
 – nominal boiler output CO₂ value – 8,5 %

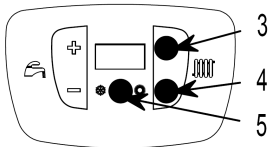

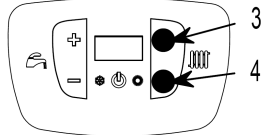

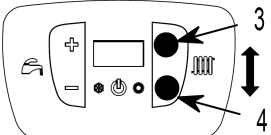

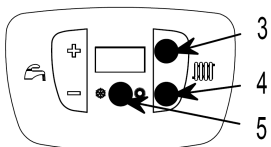

Propane:

CO₂ – minimum boiler output CO₂ value – 9,5 %
 – nominal boiler output CO₂ value – 9,5 %

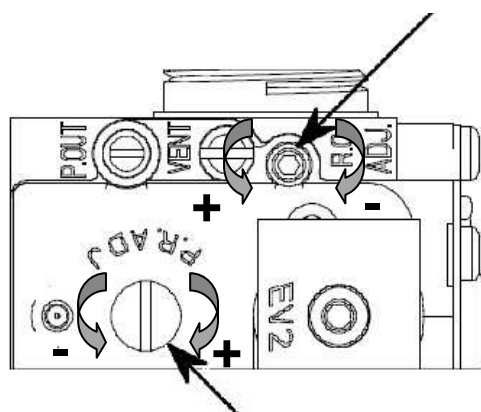
When the set parameters do not correspond with the values shown above follow the instructions in the Servicing Manual.

Servicing

Activation of the “chimney-sweeper” function:

Control panel	Screen	Description
		Press down buttons 3,4 and 5 simultaneously and hold them down for 10s. The number of the currently set parameter will start flashing on the boiler screen
		Press down buttons 3 and 4 simultaneously. The screen will show LP (minimum output) and the value for the current water temperature in the boiler heating circuit
		Using buttons 3 and 4 it is possible to set the output „LP“ Minimum output in the hot water heating mode „hP“ Minimum output to the heating system „cP“ Maximum output to the heating system “dP“ Maximum output in the hot water heating mode
		For deactivation of the “chimney-sweeper” function press down buttons 3,4 and 5 simultaneously The screen will show indication for the summer or winter operation

CO₂ setting at max. power output



CO₂ setting at min. power output

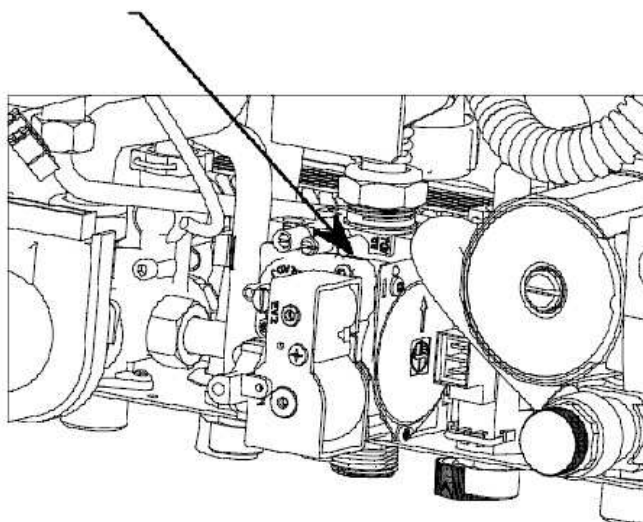
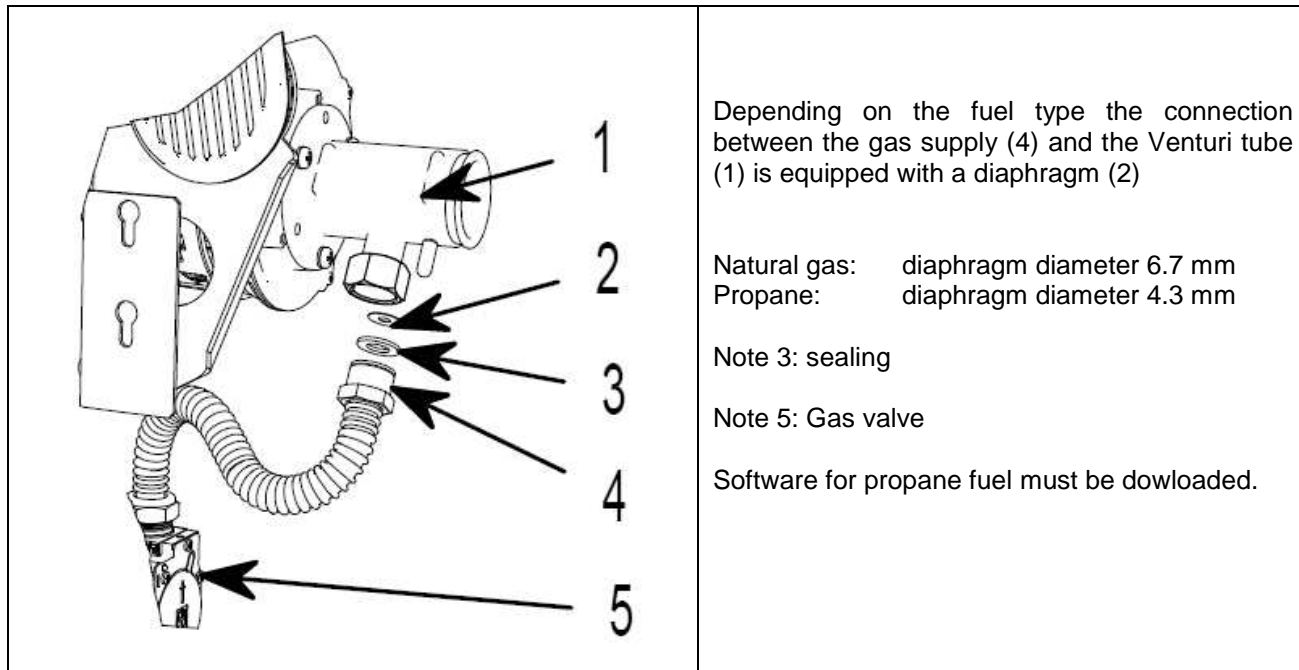


Fig. no. 30 Gas valve adjusting screw

12.3 Conversion to a different type of fuel



12.4 Boiler Electronics Setting

Setting parameters

The product meets the values for "Environment Friendly Product".

Note: The actual values measured depend on the type of connection of the combustion air supply and flue gas removal for the given appliance.

Checking the boiler parameters settings, entering the servicing menu.

Designed for professional servicing of the product only.

SIT electronics parameters set in the manufacturing factory.

parameter	function	adjustment	range/adjustment
Pr 01	Boiler type	08	K4G1S24ZX
		01	K4G2S24ZX
		12	K4G3S24ZX
Pr 02	Determination of water flow in the boiler by the sensor	Dependence (determines) Pr 01	00 = water pressure switch/flow switch
			01 = water pressure sensor/flow meter
			02 = water pressure sensor/flow switch
			03 = water pressure switch/flow meter
Pr 03	Pump control	Dependence (determines) Pr 01	00 = pump still at maximum power
			01 = pump still at maximum power
			02 = pump output is automatically controlled
Pr 04	Zones control	Dependence (determines) Pr 01	00 = (not used)
			01 = (not used)
			02 = (not used)
			03 = (not used)
Pr 05	Gas type	00	00 = G20
			01 = G25
			02 = Fam. L
			03 = Fam. LL
			04 = G30
			05 = G31
Pr 06		60	K4G2S24ZX version only
Pr 07	Output temperature MAX	85	45 ... 85°C
Pr 08	Parameters configuration	00	04 = partial reset (not used)
			39 = total reset
Pr 09	Sweep test	00	00 = sweep test off
			01 = sweep test HW min. power
			02 = sweep test heating min. power
			03 = sweep test heating max. power
			04 = sweep test HW max. power
Pr 10	Anti-cyclic time	30 (3 min)	00 (= 0 sec) ... 100 (= 600 sec)
Pr 11	Post-circulating heating time	10 (1 min)	00 (= 0 sec) ... 100 (= 600 sec)
Pr 12	Heating power MAX	Dependence (determines) Pr 01	00 (= 0%) ... 100 (= 100%)

Servicing

parameter	function	adjustment	range/adjustment
Pr 13	Heat pump stroke	00	00 = pump controlled by the indoor unit
			04 = pump runs continuously
Pr 14	Ignition performance	Dependence (determines) Pr 01	00 (= 0%) ... 100 (= 100 %)
Pr 15	OTC selection	00	00 = OFF
			01 = (= 0,1) ... 60 (=6,0) K value
Pr 16	Heating power MIN	Dependence (determines) Pr 01	00 (=0%) ... 100 (=100%)
Pr 17	HW heating - for combined version only	00	00 = burner STOP fixed at $T_{TV} = 65\text{ }^{\circ}\text{C}$
			01 = burner STOP at $T_{boilermax} + 5\text{ }^{\circ}\text{C}$
Pr 17	Antilegionella - for stationary boiler only	00	00 = OFF
			01 = every two days
			02 = every three days
Pr 18	Reverse	00	00 = reverse not measured
			01 = reverse measured
			02 = TBD
			03 = (= 3 $^{\circ}\text{C}$) ... 30 (= 30 $^{\circ}\text{C}$) ΔT maintained between outlet and reverse
Pr 19	User Interface	Dependence (determines) Pr 01	00 = UI 585561 (bar/ $^{\circ}\text{C}$)
			01 = UI 585561 (bar/ $^{\circ}\text{F}$)
			02 = UI 585520
Pr 20 - 23	Not used		
Pr 24	Zones activation - only when Pr=01 or 02 - when both zones are required	15	0 ... 30min
Pr 25		45	
Pr 26		80	K4G2S24ZX version only
Pr 27	Heating temperature MIN	25	25 ... 45 $^{\circ}\text{C}$
Pr 28	Service inspections	12	00 (= 0 months) ... 48 (= 48 months) service
			99 = service alert canceled
Pr 29	HW reverse scanning	Dependence (determines) Pr 01	00 = HW reverse not measured
			01 = HW reverse measured
			02 = TBD
			03 = TBD
			04 (=4 $^{\circ}\text{C}$) ... 45 (=45 $^{\circ}\text{C}$) temperature of HW reverse
Pr 30	Minimum water pressure	10	00 = monitoring only min. water pressure
			01 = TBD
			02 = TBD
			03 = TBD
			04 = TBD
			05 (=0,5 bar) ... 15 (=1,5 bar) water pressure adjustment

TBD = To Be Determined

13. Servicing Inspection of the Boiler

The user is obliged ensure regular annual servicing inspections of the boiler.
When these conditions are not observed the owner cannot clam warranty repairs.

The instructions for the servicing inspection procedure is available for servicing organizations.

Main points of the inspection:

- Check of liquids leakage from boiler's joints;
- Check of pressure in the expansion tank;
- Check of the adjustment of CO₂ of the gas valve (emission), should be performed 1 x per year;
- Disassembling of the burner and check of exchanger and electrodes state;
- Check of siphon clogging for condensate discharge;
- Bleeding of the exchanger;
- Check of chimney flue.

Attention: Before you remove the boiler casing, disconnect the boiler from the electric supply.

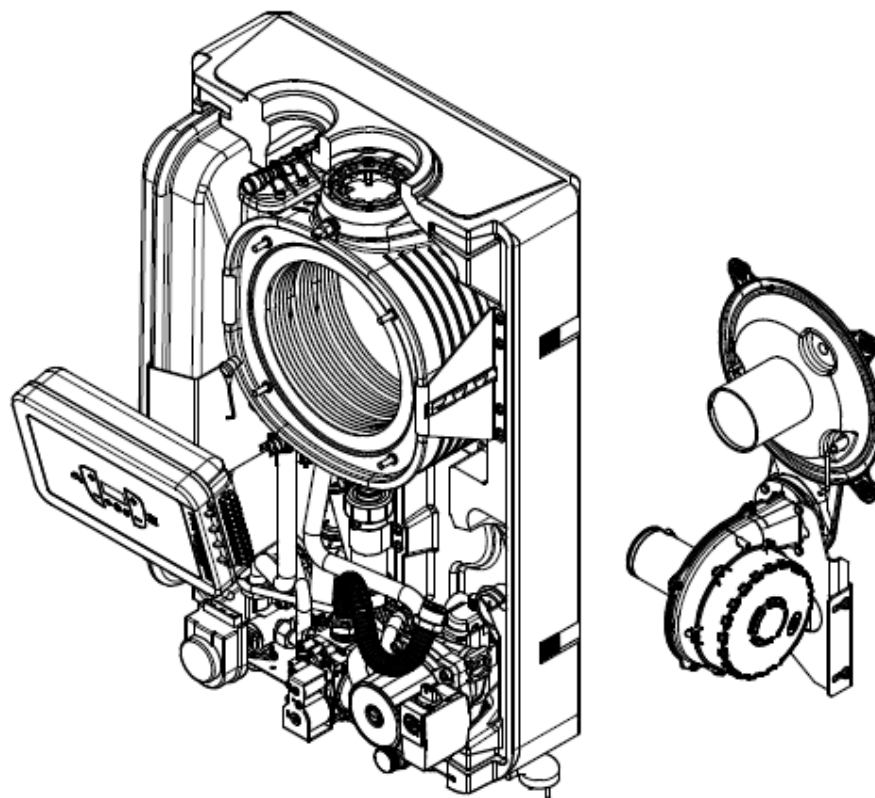


Fig. no. 31 Exchanger inspection

Information for customer

Packaging identification	Assessment reference
PE Plastic sacks, folie, corrugated board, iron and plastic fix line	

Identification of principal materials used. Paper, Polyethylene, iron, wood

Part 1: Summary of assessment

Standard/Report	Assessment requirement	Claim	Note
1.1 Prevention by source reduction		YES	
1.2 Heavy metals and	ensure below maximum permitted levels for components (CR 13695-1)	YES	
1.3 Other noxious/hazardous substances	ensure in compliance with (ČSN 77 0150-2, EN 13428)	YES	
2 Reuse	ensure reusability in all terms of the standard for the functional packaging unit (EN 13429)	NO	
3.1 Recovery by material recycling	ensure recyclability in all terms of the standard for the functional packaging unit (EN 13430)	YES	
3.2 Recovery in the form of energy	ensure that calorific gain is achievable for the functional packaging unit (EN 13431)	YES	Iron - NO
3.3 Recovery by composting	ensure compost ability in all terms of the standard for the functional packaging unit (EN 13432)	NO	

NOTE	Conformity with EN 13427 requires affirmative responses to sections 1.1; 1.2; 1.3 and to at least one of 3.1; 3.2; 3.3. In addition, where a claim of reuse is made section 2 should also record affirmative responses.
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Part 2: Statement of conformity

In the light of the assessment results recorded in part I above, this packaging is claimed to comply with the requirements of EN 13427.

RECORD OF THE BOILER COMMISSIONING

This side is used to confirm the inspection service and is kept by the customer!!!	Operator (surname, name)	
	Address (street, city, postal code)	
	Phone/Fax/e-mail address	
	Boiler serial number Date of commissioning	
	Service organization (stamp and signature)	
	Mandatory service inspection after 1 year of operation	
	Date Service organization stamp and signature.....	
	Mandatory service inspection after 2 years of operation	
	Date Service organization stamp and signature....	
	Mandatory service inspection after 3 years of operation	
Date Service organization stamp and signature.....		
Mandatory service inspection after 4 years of operation		
Date Service organization stamp and signature.....		
Mandatory service inspection after 5 years of operation		
Date Service organization stamp and signature.....		
Mandatory service inspection after 6 years of operation		
Date Service organization stamp and signature.....		

Annex to the Warranty Certificate for the Customer – User

A record of warranty and after-warranty repairs and regular annual product inspections performed			
Date of entry	Activity performed	Contracted service organization (signature, stamp)	Customer's signature

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